Document ID:EDF-4478
Revision ID:3
Effective Date:04/28/05

Engineering Design File

PROJECT NO. 23927

Waste Inventory Estimate for the Described Area within Pit 4 for the Accelerated Retrieval Project within the Radioactive Waste Management Complex

INEEL
Idaho National Engineering and Environmental Laboratory

Form 412.14
10/9/2003
Rev. 05

EDF No.: 4478 EDF Rev. No.: 3 Project File No.: 23927

1. Title: Waste Inventory Estimate for the Described Area within Pit 4 for the Accelerated Retrieval Project within the Radioactive Waste Management Complex

2. Index Codes:
Building/Type NA SSC ID NA Site Area RWMC

3. NPH Performance Category: _____ or ☒ N/A

4. EDF Safety Category: _____ or ☒ N/A SCC Safety Category: _____ or ☒ N/A

5. Summary:

This engineering design file summarizes information on the weights, volumes, and transuranic (TRU) activities, by waste type, of waste disposed of in the described area of Pit 4 (formerly Area G) of the Radioactive Waste Management Complex. The disposed waste includes shipments ranging from April 1964 to April 1967. Revision 3 of this document updates the buried waste inventory estimate to reflect improved waste location information for Pit 4 waste disposals occurring in 1964 and corrected retrieval area coordinates. Appendix A contains a summary of waste types by disposal ID for the waste shipments contained in the described area of Pit 4. Waste distribution maps, by waste type, and information for tracking project progress have been added (Appendix B and C, respectively).

The estimated weights and as-disposed volumes (by waste type) of waste shipments within the described area of Pit 4 are summarized below:

Waste Category	Weight (lb)	Volume (ft^3)
RFP Series 741 sludge	500,224	7,317
RFP Series 742 sludge	404,963	6,082
RFP Series 743 sludge	431,046	5,846
RFP Series 744 sludge	51,615	853
RFP Beryllium	46,222	1,653
RFP Roaster oxide	81,294	878
RFP Graphite	56,995	1,505
RFP Filters	124,280	13,047
RFP Line generated waste	25,153	750
RFP combustible debris	359,910	23,503
RFP noncombustible debris	926,244	49,053
Non-RFP sludge	42,407	1,279
Non-RFP combustible debris	84,645	5,923
Non-RFP noncombustible debris	262,806	18,920
Totals	3,397,804	136,609

6. Review (R) and Approval (A) and Acceptance (Ac) Signatures:
(See instructions for definitions of terms and significance of signatures.)

	R/A	Typed Name/Organization	Signature	Date
Co-Performer	A	Jeffrey D. Bryan/3F30	Jeffrey D. Bryan	4-28-05
Co-Performer	A	Danny L. Anderson/3F20	Danny L. Anderson	4-28-05
Operations	R	Kevin E. Streeper/3F71	KEVIN E. STREEPER by Jeffrey D. Bryan per Email	4-28-05
Analyst		NA		
Requestor (if applicable)	A	Steven A. Davies/3F30	Steven A. Davies	4/28/05
Checker	R	William H. Landman/3F30	W H Landman	4/28/05
Doc. Control	AC	Beth L. Love	Beth L. Love	4/28/05

EDF No.: 4478 EDF Rev. No.: 3 Project File No.: 23927

1. Title:	Waste Inventory Estimate for the Described Area within Pit 4 for the Accelerated Retrieval Project within the Radioactive Waste Management Complex
2. Index Codes:	Building/Type NA SSC ID NA Site Area RWMC
7. Distribution: (Name and Mail Stop)	R. E. Arbon/MS 3875, S. L. Austad/MS 3920, J. D. Bryan/MS 3920, J. H. Call/MS 4201, T. L. Clements/MS 2414, B. R. Helm/MS 3920, L. E. Guillen/MS 3920, W. H. Landman/MS 3920, S. A. Davies/MS 3920, Records Coordinator (Mary McQuiston)/MS 3920.
8. Does document contain sensitive unclassified information?	☐ Yes ☒ No
If Yes, what category:	
9. Can document be externally distributed?	☒ Yes ☐ No
10. Uniform File Code: 6102	Disposition Authority: ENV1-h-1
Record Retention Period: See LST-9	
11. For QA Records Classification Only:	☐ Lifetime ☒ Nonpermanent ☐ Permanent
Item and activity to which the QA Record apply:	
12. NRC related?	☐ Yes ☒ No
13. Registered Professional Engineer's Stamp (if required)	NA

Waste Inventory Estimate for the Described Area within Pit 4 for the Accelerated Retrieval Project within the Radioactive Waste Management Complex

1. INTRODUCTION

The Radioactive Waste Management Complex at the Idaho National Laboratory (INL) was used for subsurface disposal of transuranic (TRU) waste in various pits and trenches of the Subsurface Disposal Area (SDA) from 1952 until 1970, when the practice was suspended in favor of aboveground, retrievable storage. Low-level waste (LLW) from the INL and elsewhere was also disposed of in these pits and trenches. As part of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq., 1980) non-time critical removal action (NTCRA), the U.S. Department of Energy is retrieving some of this waste from the SDA. The Accelerated Retrieval Project (ARP) is responsible for the retrieval and processing of the targeted waste[a] from the described area within Pit 4 of the SDA within the Radioactive Waste Management Complex. This engineering design file (EDF) estimates the quantities (i.e., volume and weight) and TRU activity of the waste disposed of in the described area. This information can be used to support planning for the amount of CERCLA waste to be generated by the NTCRA. The TRU activity estimates (i.e., by waste type) also allow the efficiency of the targeted waste visual identification approach to be calculated.[b]

2. SITE LOCATION

A study was conducted as part of the Pit 9 Stage III Project to evaluate and prioritize various alternate areas of the SDA for possible removal of TRU contamination and collocated hazardous volatile organic compounds. These areas (originally designated as A through J) were evaluated against a number of criteria (e.g., total TRU content, total volatile organic compound content, and accessibility). The described area (formerly identified as Area G) of Pit 4 was selected as the preferred site for the NTCRA. Pit 4 is located in about the center of the SDA and the described area is located in the eastern half of Pit 4. Specific coordinates for the described area are provided in Drawing #628247.

As can be determined from these coordinates, the described area within Pit 4 is roughly rectangular. The approximate dimensions of the described area are 264 ft (east-west) by 126 ft (north-south).

3. WASTE DISPOSAL INFORMATION AND ESTIMATE DEVELOPMENT

Both TRU waste and LLW were disposed of in Pit 4. Waste was generally disposed of from west to east over time. The majority of waste came from the Rocky Flats Plant (RFP) near Denver, Colorado, and

---

a. Targeted waste types include Series 741 and 743 sludges, graphite, filters (including filter media), and depleted uranium roaster oxide.

b. The calculated efficiency (i.e., cumulative measured curies retrieved divided by the cumulative curies estimated to be in the area retrieved) will be, at best, an approximate value that is subject to multiple sources of error including, for example, the following data or processes: the accuracy of the SDA radionuclide inventory (in CIDRA), the representativeness of the TRU allocation scenario (by SMBA), the accuracy of the disposed waste locations (in WILD), the accuracy of waste type assignments (in WILD based on trailer load list reviews and data entry), and the accuracy of retrieved waste NDA measurements.

has varying levels of TRU contamination. The LLW came from various INEEL generators as well as some off-INEEL generators. For Pit 4, the disposal process historically involved excavating an area in the SDA to the outcroppings of the basalt bedrock, backfilling the area with 2 ft (nominally) of soil, and disposing of the waste containers in a stacked[c] or random (i.e., dumped) fashion. Random dumping of the waste occurred after 1964 in order to reduce personnel exposures and improve operations efficiency.

Disposal sheets for non-RFP shipments and trailer load lists for the RFP shipments are the ultimate source for the disposal locations and waste type designations (Clements 1982). These sheets are presently maintained in the OU 13/14 Project file, which is located in the Technical Support Building in Idaho Falls. The disposal sheets are also available from INL Optical Imaging System with links from Electronic Document Management System. The location of the disposal and, in some cases, the area that the disposed containers covered were recorded for each shipment to some extent. For instance, some disposal records simply identify a point measured from a survey marker (or monument) while others provide a range of the area covered, such as 300 to 310 ft west and 70 to 90 ft north of the SE monument. The trailer load lists (for RFP shipments) and the disposal sheets also identify weights and volumes for the shipments (in most cases) but provide little information on the radioactive content in the shipment.

The information from the original shipments has been transferred to WILD, from which reports for the described area were obtained. During the preparation of Revision 0 of this EDF, several discrepancies were identified between the disposal records and the database information contained in Waste-O-Scope at the time (see Revision 1 for a description of these discrepancies). For Revision 2, a review was performed that concluded that these discrepancies had been resolved in the WILD data. This revision, like Revision 2, has been based strictly on the current WILD data as an input with no necessary adjustments as to the shipments applicable to the retrieval area, waste type assignments, and total shipment weights. However, slight corrections were made in WILD and herein to the total shipment volumes for four shipments (i.e., RFODOWSR104/076781060, TRA603SR006/24/66210, NRF618SR008/10/66215, and TAN607SR010/18/66120) where there was some disagreement between the total volume (entered directly from the disposal records) and the calculated total based on summing volumes across the waste types and generators.

Once the disposal shipments that reside completely or partially in the described area of Pit 4 were identified, WILD was queried to determine the types of wastes (including associated volumes and weights) that were included in each disposal shipment.[d] Typically, a shipment would contain various types of wastes from various generators (e.g., buildings at RFP). The RFP generated waste was divided, on the trailer load lists, into general categories as shown in Table 1.

---

c. While earlier versions of this EDF stated that there were no stacked containers in the described area, actual excavation results from ARP operations have proven otherwise. A review of Pit 4 disposal sheets from 1964 revealed that an indeterminate "end of Pit" reference point was recorded when logging the disposal location of the shipments. The reference is indeterminate because the east end of Pit 4 is angular and there is a significant difference between the eastings of the SE and NE corners of the pit. When the disposal information for these shipments was first entered into Waste-O-Scope (precursor to WILD), the SE corner of Pit 4 was typically used as the point of reference because of other notations contained on the disposal forms (i.e., "south side"). The disposal records also indicated that the 1964 RFP waste was placed into rows (i.e., stacked) during disposal.

However, based on recent observations of the ARP excavation, it is clear that the earlier assumption that the disposal location measurements of these shipments were made relative to the SE corner was in error. This assumption resulted in a predicted waste location that was too far to the west. In this revision of EDF-4478, the reference point for these shipments has been updated to reflect the midpoint of the east end of Pit 4. This updated reference point places the leading edge of the stacked waste within grid row "A"—in a location that closely corresponds to the observed location in the ARP excavation.

d. All data pulls for WILD information, RFP TRU activity allocation, and shipment polygons were made on February 24, 2005 using special files that anticipated the relocation of the 1964 stacked waste into grid row A.

Table 1. Rocky Flats Waste Types

Type	Description
Type I	Combustibles (e.g., paper, rags, and wood)
Type II	Glass and ceramics
Type III	Chemical Warfare System and high efficiency particulate air filters
Type IV	Sludges from coprecipitation treatment
Type V	Non-combustibles, scrap metal, and brick
Type VI	Empties (included in WILD as Type V)
Type VII	Series 743 Sludge (included in WILD as Type IV)
G or Gr	Graphite waste
LGW	Line generated waste (Type I or Type V)
Be	Beryllium waste or beryllium contaminated waste
R or RO	Depleted uranium roaster oxide

WILD = Waste Inventory Location Database

In developing the data for WILD, these types were converted to more descriptive categories based on additional information such as the RFP building designators and knowledge of the operations in those buildings. The waste categories used in WILD are described below. The descriptions of the various types of sludge were taken from Clements (1982).

- Series 741 sludge, also called first stage sludge: Series 741 sludge was produced from aqueous wastes from various plutonium recovery operations. The process produced a precipitate of hydrated oxides of iron, magnesium, aluminum, and silicon that also carried some hydrate plutonium and americium oxides. The precipitates were filtered to produce a sludge containing 50 to 70 wt% water. The water was absorbed, to some extent, by the addition of Portland cement.

- Series 742 sludge, also called second stage sludge: Series 742 sludge was generated in a fashion similar to the Series 741 sludge from various RFP aqueous streams that were lower in TRU content than the streams generating the Series 741 sludge and generally contain lesser amounts of plutonium or americium.

- Series 743 sludge, also called organic setups: Series 743 sludge is very different from the Series 741 and 742 types of sludge. Series 743 sludge is the result of stabilizing various organic wastes (e.g., carbon tetrachloride, trichloroethylene, tetrachloroethylene, Texaco Regal Oil, and other miscellaneous oils and degreasing agents). These types of liquid waste were mixed with calcium silicate to form a grease or paste-like substance. Waste containers designated as 74A on the trailer load lists are thought to be a precursor to the Series 743 sludge and are included in this category.

- Series 744 sludge, also called special setups: Series 744 sludge contains organic liquids that were stabilized with cement rather than calcium silicate. Containers of Series 745 sludge are expected to be firm monoliths.

- Series 745 sludge, also called evaporator salts: Series 745 sludges are nitrate salt residues from solar evaporation ponds that were used at one time at RFP. The chemical make-up of these salts is expected to be 60% sodium nitrate, 30% potassium nitrate, and 10% miscellaneous inorganic compounds. This waste stream was generated from the liquid effluent from the second stage treatment process and, as a result, expected to be very low in TRU content. No Series 745 sludge is expected to be present in the ARP retrieval area.

- Beryllium waste: Waste identified as coming from RFP buildings 444, 776, or 777 and designated on the trailer load lists as containing beryllium was categorized as beryllium waste. It is not clear whether this material was beryllium metal, other materials that were contaminated beryllium, or a combination of the two.

- Roaster-oxide waste: Some types of waste from RFP Building 444 were designated as roaster-oxide waste. This roaster-oxide waste is incinerated depleted uranium.

- Graphite waste: Graphite was used as molds for certain casting operations. The plutonium was recovered to the extent practical from the graphite before it (the graphite) was disposed of. Data from various studies and measurements indicate that these graphite wastes may have some of the highest TRU contamination levels.

- Filters: This category is expected to contain the various high-efficiency particulate air filters. Other types of process filters may also be included in the shipments designated as filters in WILD.

- Line-generated waste: This category is expected to contain various waste materials removed from the plutonium-processing gloveboxes including items such as glovebox gloves, combustible waste, graphite, and filters.

- Combustible debris: Waste comprising paper, plastic, wood, and other combustible materials was designated as combustible debris.

- Metal debris: Waste that was predominantly metallic (e.g., pipe, conduit, and empty drums) was designated as metal debris.

These last two categories (i.e., combustible and metal debris) contained both RFP- and INEEL-generated waste.

It was necessary to perform some reformatting and processing of the WILD data in order to generate the values in this estimate. First, some data processing was necessary due to the way that waste type information is stored in WILD. Specifically, records previously tracked in Waste-O-Scope as mixed waste types (e.g., shown as both Type I and Type V) have been replicated in WILD so that each record has only one waste type. The associated number of containers, weight, and volume is the same for each record (i.e., these parameters were not partitioned when the mixed waste type records were separated). Therefore, to prevent double counting in this estimate, an Excel-spreadsheet process was developed that would identify such instances (i.e., based on duplicate field values) and partition the weight and volume equally to the affected single-waste-type records. For example, if two WILD records have the same detail key and exactly the same weight, volume, and container count (indicating the split of a mixed-waste-type record), the associated weight and volume would be divided by two for each record. If there were three records with the same detail information (indicating that the containers held three waste types), the associated weight and volume was divided by three for each record.

Second, some waste disposal footprints were adjusted from that provided by WILD. As discussed above, some disposal locations are identified by only one or two points rather than a rectangular range (four points) with respect to one of the pit monuments. These disposals are shown as circles or ellipses in associated shape files, respectively. One option from WILD, for reporting the area of these disposals, is to have the database adjust the disposal area based on the depth of the waste zone in the location of the disposal. For disposals containing a large volume of waste, this is desirable to ensure the "depth" of the disposal does not exceed the physical limits of the pit. It also provides a visual indication of how large the shipment was. However, for small disposals or for deeper sections of the pit, the areal footprint can be quite small—suggesting a positional accuracy that is not likely to be representative of the actual location. For this reason, the WILD areas for disposals having only one locator point have been adjusted such that no disposal area is less than 100 ft^2 (e.g., a 10- × 10-ft square). This is consistent with anecdotal estimates of the positional accuracy of the disposal location information that was documented at the time the waste was buried. Also, the disposal area shapes for all disposals have been simplified to rectangles for this analysis. Two large object shipments were also adjusted as discussed in more detail below.

The estimated locations of the disposal shipments are depicted in Figure 1.

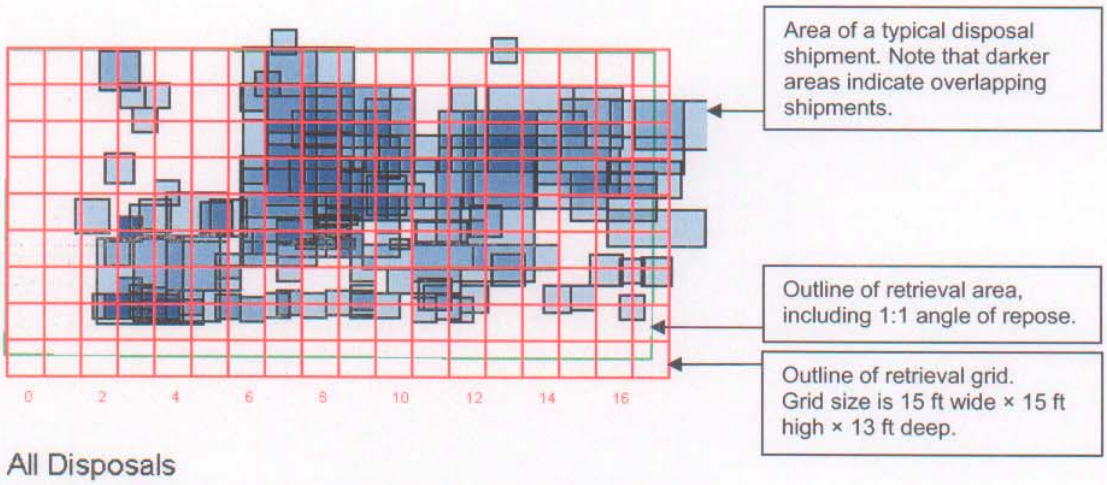

Figure 1. Disposal shipment locations for the Described Area of Pit 4.

While not specifically identified in WILD, it was noted in the review of the records that three shipments could potentially be classified as large objects. All three shipments are from Test Area North (TAN). The first shipment, TAN633SR005/02/66130, was recorded as weighing 9 tons and consisting of the ML-1 reactor skid and shielding. This shipment is also recorded as having 20 Ci of activity and having a 30 mrem/hour dose rate on contact. The other two, shipments TAN607SR005/16/66115 and TAN607SR005/17/66115, were associated with a refueling machine support structure, refueling machine 046 fixture, and (or constructed of) Schedule 140[a] steel pipe (no other description is available). Each of these shipments is documented as having a dose rate of 150 mrem/hour on contact and a volume of 5,750 ft^3. Because the disposal location information shows multiple disposals in the same vicinity, the WILD footprints for these two disposals have been scaled up by a factor of 2.5 to avoid a situation where the

a. Schedule 140 steel pipe typically ranges from 8 to 24 inches in diameter with a nominal wall thickness of between 0.8 and 2 inches, respectively.

combined waste shipment depths (i.e., shipment volume divided by assumed footprint) would exceed the depth of the pit.

This revision includes, in Section 5, an estimate of TRU activity (limited to Am-241, Pu-239 and Pu-240) by waste type. This estimate assists decision-makers in identifying waste forms that may be efficient to target for removal as part of the NTCRA. This estimate also allows prediction of the average TRU activity concentration of the material remaining in the pit after removal of the targeted waste forms.

The complete process used to develop the volume, weight, and TRU activity estimates is diagrammed in Figure 2. Screen shots from the ARP Model Application (Java program) video display have been included as Appendix B. These figures provide the reader with a general overview of how the various waste types are geographically distributed within the retrieval area.

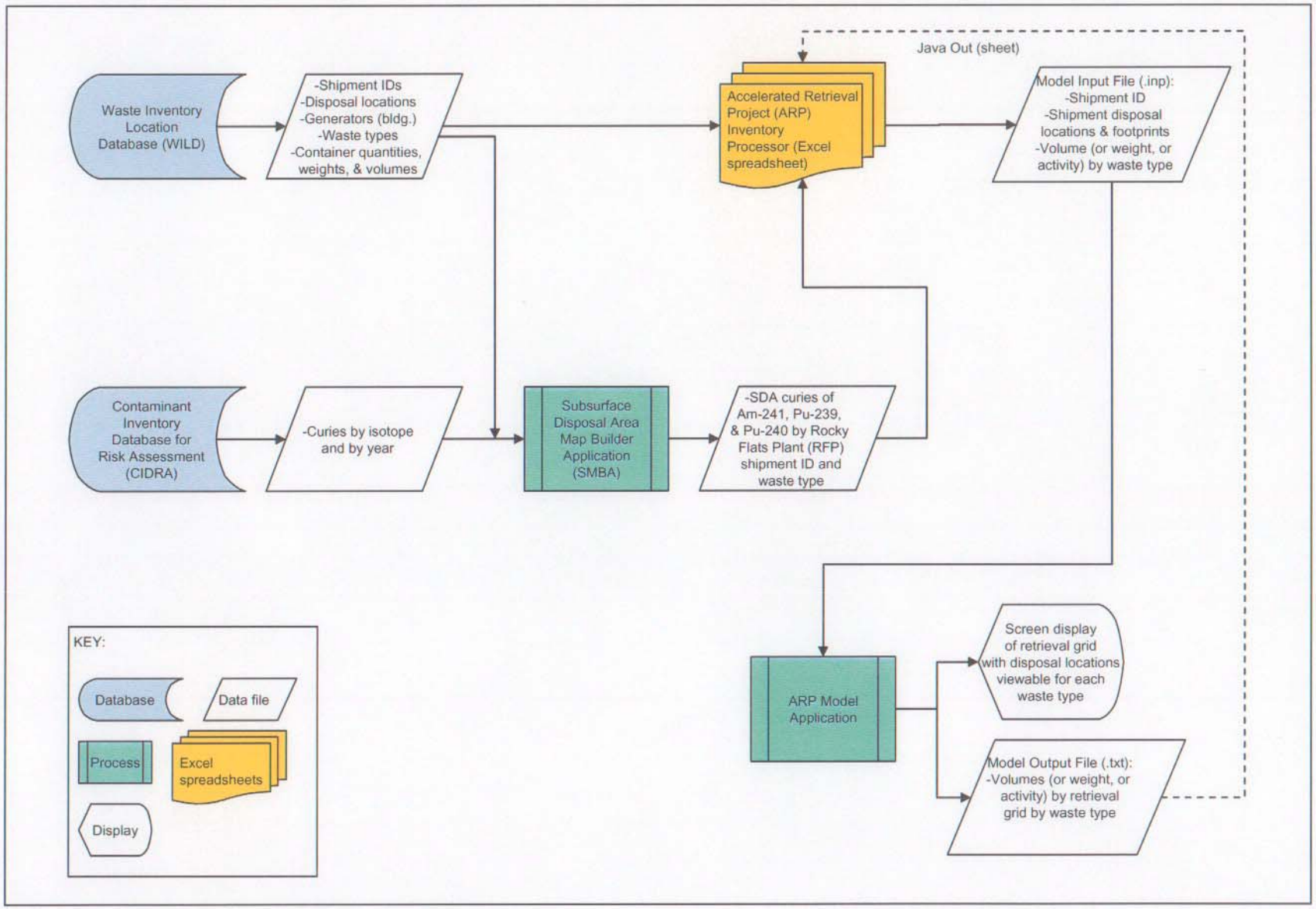

Figure 2. Diagram of data reduction and preparation process

The following functions are performed by the spreadsheets and ARP Model application (shown in Figure 2) that were developed to generate the volume, weight and activity estimates contained in this EDF. The list below is not meant to be all encompassing, but identifies those functions that are primary to the generation of the estimates:

ARP Inventory Processor.xls

TRU Activity Processing and Summarization:

- Uses a subset of the activity data, from the SDA Map Builder Application (SMBA)—limited to only those records that are applicable to the ARP retrieval area.
- Creates a lookup key to uniquely identify isotopic activity allocation (in curies) for each shipment and RFP waste type. This lookup table is used later during the WILD shipment data processing (described below)
- Summarizes TRU isotopic activity allocation (i.e., Am-241, Pu-239, and Pu-240) by ARP RFP disposal shipment. This summary provides a means to check that the spreadsheet is accounting for all the TRU activity allocated to each shipment by the SMBA
- Summarizes TRU isotopic activity allocation (i.e., Am-241, Pu-239, and Pu-240) by RFP waste type (e.g., series-741 sludge, graphite, filters, and line-generated waste).

WILD Shipment Data Identification, Summarization, and Processing:

- Allows user input to select between standard disposal footprints provided by WILD, 100 ft^2 for all circular disposals, or 100-ft^2 minimum for circular disposals. All disposal footprints are simplified to a rectangular shape for use by the ARP Model java program.
- Detects WILD records for drums containing multiple waste types and uses user-defined rules to allocate drum volumes and weights between the identified waste types. This is to prevent double counting of the waste volumes and weights.
- Creates a lookup key so that waste volumes (or weights, or activities [from the TRU activity processing described above]) can be summarized by waste type for each shipment ID.
- Allows the creation of a drawing file (e.g., .dxf format) that can be used to check that the disposal-location data is converted correctly.
- Creates the text (.inp) file that is input for the ARP-Model-java program. This file contains the disposal locations for each waste shipment and the associated volumes (or weights, or TRU activities) for each waste type.
- Provides a user interface to simplify data entry of retrieval-grid-input parameters for the execution of the ARP-Model (Java program).
- Pulls the ARP-Model-java-program output (a .txt file) back into the spreadsheet for subsequent use and analysis.

ARP Model.jar:

- Draws a retrieval grid over the described area of Pit 4 (i.e., the ARP retrieval area) based on parameters entered in the program's execution line.

- For each disposal record in the input file, this program partitions the waste volume (or weight, or TRU activity) by waste type into the applicable retrieval grids. For this partitioning, the volume (or weight, or TRU activity) for each waste type is assumed to be evenly distributed over the disposal footprint. For example if 40% of a shipment's disposal footprint lies within a retrieval grid, then 40% of the volume of each waste type contained in that shipment is placed within that retrieval grid.

- Creates an output text (.txt) file that identifies the total volume (or weight, or TRU activity) of each waste type contained within each retrieval grid location.

- Displays retrieval grid and disposal elements either for all shipments or by waste type (i.e., only the shipments containing the selected waste type).

For this estimate, the dimensions of the retrieval grid were set at 15 ft wide by 15 ft high. This grid corresponds to the grid system laid out within the ARP Retrieval Enclosure to support sampling activities. The depth of the retrieval grid has been set at 13 ft., which corresponds to the anticipated depth of the waste zone (not including the overburden, potentially contaminated soil, and underburden layers).

4. WASTE VOLUME AND WEIGHT ESTIMATES

The WILD data contains the volume and weight of each disposal shipment. The volumes were, in most cases, the volumes of the containers, as disposed. In other words, the volume of a 55-gal drum was recorded as "55 gals" (or 7.4 ft^3) rather than the actual volume of the waste within the container. In some cases (e g., dumpsters), the volume recorded was the volume of the dumpster, not the actual volume of the waste. Thus, the volume of waste in the various waste categories probably over-estimates the actual as-disposed volume.[f] The weights were recorded in pounds. Appendix A contains a summary of waste types by disposal ID for the waste shipments contained in the described area of Pit 4, which includes the area of the angle of repose.

Waste was received in a number of container types, and in many cases the exact container type was not specified. Generally, however, all types of RFP-generated sludge were contained in 55-gal drums.[g]

The as-disposed weights and as-disposed volumes are shown in Table 2. As discussed previously, in Section 3, the weight and volume values obtained from WILD for the RFP wastes required some processing to prevent double counting. This condition is due to certain containers being identified in the

---

f. While the actual volume of targeted waste is expected to be less than the disposed volume (i.e., because of voids within the disposal containers or crushing that may have occurred during pit disposal operations), it is expected that the retrieved and repackaged waste volume will be at least twice the original targeted waste disposed volume. This increase is due to factors such as mixing (with nontargeted waste and soil) during excavation and identification, expansion (swell), and allowances needed to ensure the waste and tray liner fit within the new drum. Such increases have already been observed from ARP operations to date.

g. Based on ARP experience to date (i.e., in grid row A), many of the drums that were disposed of in a stacked manner still have significant structural integrity. Later containers that were randomly dumped or that contained organic sludges may exhibit a greater level of degradation like those encountered during the Glovebox Excavator Method Project.

trailer load lists as holding combinations of waste types. WILD tracks each waste type separately, so the container count, weight, and volume data in each WILD record reflects the total container count, weight, and volume of the associated containers. Summing by waste type can thus cause double counting. The values in Table 2 below for weight and volume have been adjusted from the WILD values to prevent any double counting. Typically, an equal portion of the original weight and volume of the combined-waste-type containers is allocated to each waste type (e.g., ½ of the original volume and weight to each waste type if two waste types were present in the containers, 1/3 of the original volume and weight to each waste type if three waste types were present in the containers).

Table 2. Summary of as-disposed volumes and weights for all shipments (or portions thereof) within the described area of Pit 4.

Waste Category	Weight (lb)	Volume (ft^3)
RFP Series 741 sludge	500,224	7,317
RFP Series 742 sludge	404,963	6,082
RFP Series 743 sludge	431,046	5,846
RFP Series 744 sludge	51,615	853
RFP Series 745 sludge	0	0
RFP Beryllium	46,222	1,653
RFP Roaster oxide	81,294	878
RFP Graphite	56,995	1,505
RFP Filters (HEPA)	124,280	13,047
RFP Line generated waste	25,153	750
RFP combustible debris	359,910	23,503
RFP noncombustible debris	926,244	49,053
Non-RFP sludge	42,407	1,279
Non-RFP combustible debris	84,645	5,923
Non-RFP noncombustible debris	262,806	18,920
Totals	3,397,804	136,609

These volumes and weights have been adjusted to account for disposal shipments that intersect the boundaries of the retrieval grid as shown in Figure 1. In other words, if only part of a disposal shipment was within the retrieval grid area, the fraction of the disposal shipment that was outside the grid boundary was ignored. Even so, this estimate may slightly over-predict the amount of waste to be retrieved because the grid is slightly larger than the planned retrieval area (on the east side) and because waste below the angle of repose is included—as if the excavation had vertical sides to the full depth of the pit. The slope of the retrieval pit will intersect the waste zone on the west, north, and east sides of the pit (i.e., leaving any waste that happens to lie below the slope in the retrieval area). The slope on the south is thought to intersect only soil (i.e., the undisturbed strip between Pits 4 and 10); although some geophysical mapping data suggests that some metallic waste might be encountered. Modeling of a three dimensional distribution of the waste to account for this slope was not warranted because the vertical distribution of the shipments is not known.

The plan for retrieving waste zone material from the described area of Pit 4 involves two campaigns. In the first, an initial trench is opened on the west side of the retrieval area. Second, a moving trench campaign is then conducted by excavating swaths of waste zone material from the east side of the trench and relocating it to the west side while removing any targeted waste encountered. Thus, the trench is moved from west to east as the excavation proceeds. Table 3 identifies the approximate as-disposed volumes of waste (by type) that will be retrieved in each quarter of the retrieval area. Finer discrimination is not warranted for waste retrieval planning or characterization purposes due to the estimated 20 ft positional error associated with the Pit 4 monuments (Yokuda 1992).

Table 3. Summary of as-disposed volumes by quarter (1/8-acre sections—west to east).

Waste Category	Volume in 1st Quarter (ft^3)	Volume in 2nd Quarter (ft^3)	Volume in 3rd Quarter (ft^3)	Volume in 4th Quarter (ft^3)	Total Volumes (ft^3)
RFP Series 741 sludge	1,168	2,500	2,407	1,242	7,317
RFP Series 742 sludge	1,483	2,385	1,699	515	6,082
RFP Series 743 sludge	33	931	1,608	3,274	5,846
RFP Series 744 sludge	0	2	428	423	853
RFP Series 745 sludge	0	0	0	0	0
RFP Beryllium	244	963	371	75	1,653
RFP Roaster oxide	198	135	395	150	878
RFP Graphite	196	1,287	22	0	1,505
RFP Filters	1,641	2,043	6,400	2,963	13,047
RFP Line generated waste	132	42	240	336	750
RFP combustible debris	5,679	8,738	5,856	3,230	23,503
RFP noncombustible debris	2,799	8,015	21,823	16,416	49,053
Non-RFP sludge	0	407	872	0	1,279
Non-RFP combustible debris	2,858	2,211	781	73	5,923
Non-RFP noncombustible debris	11,625	6,083	1,065	147	18,920
Totals	28,056	35,742	43,967	28,844	136,609

For ARP progress reporting and performance-based incentive tracking purposes only, Appendix C contains targeted waste volume and activity estimates by retrieval grid (15 ft × 15 ft). The inclusion of these grid-by-grid values must not be interpreted to imply that the waste inventory locations are accurate to this level.

5. TRANSURANIC ACTIVITY ESTIMATE

Table 4 provides an estimate of the TRU activity disposed of in the described area of Pit 4. This estimate includes the principal TRU radionuclides only (i.e., Pu-239, Pu-240, and Am-241) and uses the SMBA scenario for allocation of TRU activity (from CIDRA) to applicable RFP waste types (i.e., using the Ci/lb basis). This estimate, therefore, is consistent with the method used to produce the OU 7-13/14

TRU density maps of the SDA. It is important to note, however, that certain waste types that are known to contain TRU contaminants were not allocated a part of the total TRU activity under the SMBA scenario. It is believed that the contribution of activity from these minor sources is not significant compared to the more heavily contaminated RFP waste forms (i.e., Series 741 sludge, filters, and graphite). When excavated, the minor contributors (e.g., series 742 sludge) are still likely to be contaminated at TRU-waste levels. This estimate does not adjust for the angle of repose and TRU activity that may not be retrieved (i.e., present in targeted waste that lies under the angle of repose).

Table 4. Summary of TRU activity (Pu-239, Pu-240, and Am-241 only), as allocated for the OU 7-13/14 TRU density maps, by waste type for shipments (or portions thereof) within the described area of Pit 4.

Waste Category	Pu-239 (Ci)	Pu-240 (Ci)	Am-241 (Ci)	Total (Ci)
RFP Series 741 sludge*	931	208	19,672	20,811
RFP Series 742 sludge	-	-	-	-
RFP Series 743 sludge*	14	3	-	17
RFP Series 744 sludge	19	4	-	23
RFP Series 745 sludge	-	-	-	-
RFP Beryllium	-	-	-	-
RFP Roaster oxide*	-	-	-	-
RFP Graphite*	773	173	-	946
RFP Filters*	590	132	152	874
RFP Line generated waste	1,492	334	-	1,826
RFP combustible debris	148	33	851	1,032
RFP noncombustible debris	636	143	324	1,103
Non-RFP sludge	-	-	-	-
Non-RFP combustible debris	-	-	-	-
Non-RFP noncombustible debris	-	-	-	-
Totals	4,603	1,030	20,999	26,632

*Targeted Waste Types

From the values shown in Table 4, the removal of the targeted waste forms (containing 22,648 Ci) from the described area of Pit 4 (ARP retrieval area) should provide a TRU activity reduction of approximately 85% (22,648 Ci / 26,632 Ci).

6. CONCLUSIONS AND RECOMMENDATIONS

It is interesting to note that almost half of the waste volume in the 1st quarter of the retrieval area is non-RFP debris. Closer inspection of the disposal information indicates that this large volume is due to two shipments from TAN, recorded as a refueling machine support structure and some sort of fixture for the same (presumably) refueling machine. It is quite likely that these items would remain in the pit (large objects).

The information presented here is based on the best information available about disposals in the described area of Pit 4. It should be noted, however, that these data are approximate, at best. As noted previously, the location information for the shipments can be as little as a single point, with no indication of the area that was actually covered when the shipment was dumped into the pit. The volume information is imprecise as well. In some cases, the volume of the shipment may have been recorded as the volume of the dumpster in which it arrived at the site rather than the actual volume of waste in the dumpster. Similarly, the volume of a large shipment may have been recorded as the "bounding box" for the waste. Review of the data also indicate that, in some cases of overlapping disposal footprints, more waste volume is attributed to an area of the pit than is physically possible.

Nonetheless, the data presented here are believed to be the best data available and should be used as the design basis for the Accelerated Retrieval Project.

7. REFERENCES

42 USC § 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund)," *United States Code,* December 1980.

Clements, Jr., T. L., 1982, *Content Code Assessments for INEL Contact-Handled Stored Transuranic Wastes*, WM-F1-82-021, Idaho National Engineering and Environmental Laboratory, October 1982.

Yokuda, E., 1992, *Locations of Pits, Trenches, and Soil Vault Rows*, ERP-WAG7-05, Revision 2, EG&G Idaho, Inc., July 1992.

Appendix A

Summary of Waste Types by Disposal ID Number for the Waste Inventory Contained in the Described Area of Pit 4 Including the Angle of Repose

This page is intentionally left blank.

Table A-1. Summary of waste types by disposal ID number for the waste inventory contained in the described area including the angle of repose.

Document ID Number (Sorted by ID)	Weight (lb)	Volume (ft^3)	Disposal Location[a] (upper left corner) X-axis (ft)	Disposal Location[a] (upper left corner) Y-axis (ft)	Disposal Footprint Width (ft)	Disposal Footprint Height (ft)	Scale Factor	Waste Volumes by Type (ft^3) — Rocky Flats Plant Wastes: Series 741 Sludge	Series 742 Sludge	Series 743 Sludge	Series 744 Sludge	Line Generated Waste	Beryllium Contaminated Waste	Roaster Oxide (DU^b)	Graphite	Filters	Combustible Debris	Non-Combustible Debris	Non-Rocky Flats Plant Waste[c]: Sludge	Combustible Debris	Non-Combustible Debris
ANL601SR012/20/66800[d]	200	35	690.17	80.75	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	35	0
ANL767SR007/12/66150	3,000	34	752.83	0.50	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
ANL767SR010/13/66350	75	8	665.09	90.54	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
ARA602SR008/09/66110[e]	1,200	252	624.94	109.21	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	84	168
ARA602SR008/10/66110	300	48	604.95	107.41	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	16	32
ARA602SR012/15/65830	20,000	1200	633.41	68.44	13.69	13.69	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	1200
ARA602SR012/17/65800	1,000	50	615.34	60.13	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	50	0
ARA602SR012/17/65810	1,000	50	605.26	70.05	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	50	0
ARA602SR012/17/65820	4,000	100	685.17	80.71	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	33	67
CFA601SR005/05/66100[f]	1,000	100	600.22	75.00	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
CFA601SR005/06/66200	150	12	600.22	75.00	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
CFA601SR006/17/66131	6,000	656	609.91	103.73	10.12	10.12	1.0	0	0	0	0	0	0	0	0	0	0	0	0	219	437
CFA633SR005/06/66110	300	72	600.22	75.00	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	72	0
CFA633SR006/23/66200	80	4	609.94	108.94	10	10	1.0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
CFA654SR011/23/66800	18,000	948	700.14	85.93	19.98	9.88	1.0	0	0	0	0	0	0	0	0	0	0	0	948	0	0
CFA687SR008/16/66110	1,000	9	614.94	108.62	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
CFA690SR005/04/66320	45	12	600.22	75.00	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
CPP601SR001/03/67800[g]	500	80	705.17	80.87	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	27	53
CPP601SR001/05/67800	1,000	42	715.17	85.63	10.01	0.66	1.0	0	0	0	0	0	0	0	0	0	0	0	0	14	28
CPP601SR001/09/67800	800	40	740.21	76.16	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	13	27
CPP601SR001/23/67800	1,500	80	705.30	65.87	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	27	53
CPP601SR004/26/66230	2,000	108	594.96	106.51	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	36	72
CPP601SR005/06/66350	400	80	600.22	75.00	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	27	53
CPP601SR005/20/66110	1,000	220	704.96	106.49	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	220	0
CPP601SR005/24/66251	1,500	100	594.95	106.60	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
CPP601SR006/15/66100	1,000	100	614.95	106.76	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	33	67
CPP601SR006/15/66200	1,000	100	614.95	106.76	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	33	67
CPP601SR006/16/66151	1,000	100	614.95	106.76	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	33	67
CPP601SR007/27/66210	500	54	649.95	107.67	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
CPP601SR007/28/66210	300	54	649.95	107.67	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
CPP601SR008/09/66151	300	84	589.95	106.74	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	84
CPP601SR008/15/66110	4,000	48	604.95	107.41	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	48
CPP601SR008/15/66225	6,000	72	604.95	107.03	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	72
CPP601SR008/18/66150	1,500	81	639.95	107.19	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	27	54
CPP601SR008/25/66130	3,000	108	734.96	107.66	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
CPP601SR008/25/66184	3,000	108	719.96	107.54	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	108	0

Document ID Number (Sorted by ID)	Weight (lb)	Volume (ft^3)	Disposal Location[a] (upper left corner) X-axis (ft)	Disposal Location[a] (upper left corner) Y-axis (ft)	Disposal Footprint Width (ft)	Disposal Footprint Height (ft)	Disposal Footprint Scale Factor	Waste Volumes by Type (ft^3) — Rocky Flats Plant Wastes: Series 741 Sludge	Series 742 Sludge	Series 743 Sludge	Series 744 Sludge	Linc Generated Waste	Beryllium Contaminated Waste	Roaster Oxide (DU^b)	Graphite	Filters	Combustible Debris	Non-Combustible Debris	Non-Rocky Flats Plant Waste[c]: Sludge	Combustible Debris	Non-Combustible Debris
CPP601SR010/07/66120	1,000	100	640.05	95.33	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	100	0
CPP601SR011/07/66330	2,000	192	650.17	80.42	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	192
CPP601SR012/15/66120	2,000	96	690.17	80.75	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	32	64
CPP601SR012/16/66100	1,500	96	675.17	80.63	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	32	64
CPP601SR012/16/66220	1,000	48	665.17	80.55	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	48	0
CPP601SR012/19/66120	1,000	96	655.17	80.46	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	96	0
CPP601SR012/19/66210	2,000	120	635.26	70.29	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	120	0
CPP601SR012/20/66110	1,500	140	665.22	75.54	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	140	0
CPP601SR012/20/66210	1,500	150	690.17	80.75	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	150	0
CPP601SR012/21/66110	500	108	665.22	75.54	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	54	54
CPP601SR012/23/66120	4,000	350	685.17	84.87	29.99	1.82	1.0	0	0	0	0	0	0	0	0	0	0	0	0	350	0
CPP601SR012/27/66110	2,000	96	687.72	80.24	14.98	1	1.0	0	0	0	0	0	0	0	0	0	0	0	0	96	0
CPP601SR012/28/66110	4,000	180	675.17	84.22	10	2.81	1.0	0	0	0	0	0	0	0	0	0	0	0	0	180	0
CPP601SR012/30/66110	2,000	144	690.27	75.23	19.98	1.13	1.0	0	0	0	0	0	0	0	0	0	0	0	0	48	96
CPP630SR002/03/67800	4,000	60	695.29	65.79	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
NRF601SR007/27/66420[h]	0	162	729.96	107.12	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	162
NRF618SR001/19/67800	0	140	705.25	70.87	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	140
NRF618SR002/17/67810	6,000	270	720.34	60.96	4.99	10.04	1.0	0	0	0	0	0	0	0	0	0	0	0	0	90	180
NRF618SR007/07/66112	0	250	694.96	106.21	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	83	167
NRF618SR007/22/66415	0	380	684.97	105.45	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	127	253
NRF618SR008/10/66215	3,000	384	624.97	104.93	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	128	256
PER601SR005/06/66110	150	60	600.22	75.00	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	20	40
PER601SR005/12/66200[i]	2,500	50	662.83	-1.78	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
PER601SR005/13/66150	1,000	50	609.95	107.41	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	17	33
RFODOWSR101/06/6780010[j]	29,300	2074	710.29	66.03	30.02	9.93	1.0	0	0	0	0	0	0	0	0	244	0	1830	0	0	0
RFODOWSR101/06/6781010	38,629	1125	680.31	65.79	19.98	9.84	1.0	184	81	103	0	0	0	0	0	0	328	430	0	0	0
RFODOWSR101/06/6782020	40,370	1095	670.56	30.64	40	15.13	1.0	110	125	132	0	0	0	0	0	0	287	441	0	0	0
RFODOWSR101/06/6783010	38,502	1117	670.40	50.65	40	15.12	1.0	110	96	132	0	7	7	0	0	0	427	338	0	0	0
RFODOWSR101/16/6780000	41,081	1117	690.46	40.88	30	19.9	1.0	147	140	59	0	0	0	51	0	0	464	258	0	0	0
RFODOWSR101/16/6781000	36,636	1117	690.62	20.78	30.01	20.1	1.0	176	88	74	0	0	0	0	0	0	309	470	0	0	0
RFODOWSR101/20/6780030	26,800	2093	745.12	86.29	35.01	10.02	1.0	0	0	0	0	0	0	0	0	968	563	563	0	0	0
RFODOWSR101/20/6781050	31,126	1110	706.09	50.75	8.57	20.24	1.0	0	0	0	0	22	88	140	7	0	512	342	0	0	0
RFODOWSR101/20/67820150	38,828	1110	690.31	60.74	20.01	15.1	1.0	250	66	37	0	29	0	0	0	0	409	321	0	0	0
RFODOWSR101/20/67830120	32,339	559	690.56	20.79	20.12	20	1.0	206	242	51	0	0	0	0	0	0	59	0	0	0	0
RFODOWSR101/27/6780010	35,976	559	695.29	65.92	25.03	9.87	1.0	0	257	243	0	0	0	0	0	0	30	30	0	0	0
RFODOWSR101/27/6781030	38,600	1110	700.39	50.92	19.98	19.91	1.0	88	140	81	29	0	0	0	0	0	283	490	0	0	0
RFODOWSR101/27/6782010	35,309	559	695.45	45.91	25.02	9.88	1.0	0	397	125	0	0	0	0	0	0	19	19	0	0	0

Document ID Number (Sorted by ID)	Weight (lb)	Volume (ft^3)	Disposal Location[a] (upper left corner) X-axis (ft)	Disposal Location[a] (upper left corner) Y-axis (ft)	Disposal Footprint Width (ft)	Disposal Footprint Height (ft)	Disposal Footprint Scale Factor	Waste Volumes by Type (ft^3) — Rocky Flats Plant Wastes: Series 741 Sludge	Series 742 Sludge	Series 743 Sludge	Series 744 Sludge	Line Generated Waste	Beryllium Contaminated Waste	Roaster Oxide (DU^b)	Graphite	Filters	Combustible Debris	Non-Combustible Debris	Non-Rocky Flats Plant Waste[c]: Sludge	Combustible Debris	Non-Combustible Debris
RFODOWSR101/27/6783010	36,021	559	695.53	35.90	25.02	9.9	1.0	0	198	301	0	0	0	0	0	0	30	30	0	0	0
RFODOWSR102/03/6780020	34,668	1110	700.61	25.91	19.99	14.93	1.0	323	0	0	0	81	0	0	0	0	455	250	0	0	0
RFODOWSR102/03/6781020	27,431	1110	700.49	40.91	19.98	14.91	1.0	0	0	0	0	7	66	74	0	0	449	507	7	0	0
RFODOWSR102/10/6780020	26,955	1110	720.38	51.10	14.99	19.83	1.0	0	0	0	0	44	95	0	0	0	574	398	0	0	0
RFODOWSR102/10/6781010	35,369	559	720.49	41.10	14.99	14.83	1.0	169	118	169	44	7	0	0	0	0	29	22	0	0	0
RFODOWSR102/10/6782020	36,404	1095	730.53	31.07	15.02	20.05	1.0	316	7	0	0	15	0	0	0	0	529	228	0	0	0
RFODOWSR102/10/6783030	36,266	1117	730.37	51.07	15.01	20.06	1.0	265	66	96	15	0	0	0	0	0	328	350	0	0	0
RFODOWSR102/17/6780020	27,794	1740	730.39	51.31	40.02	14.77	1.0	0	0	0	0	0	110	74	0	1168	103	272	0	0	0
RFODOWSR102/17/67810150	31,255	559	730.47	41.31	40.01	14.78	1.0	272	103	7	59	0	0	0	0	0	66	51	0	0	0
RFODOWSR102/17/6782020	35,879	1132	730.55	31.31	40.02	14.79	1.0	0	37	287	125	0	0	0	0	0	110	573	0	0	0
RFODOWSR102/17/6783000	32,300	2213	785.31	61.57	35.01	15.13	1.0	0	0	0	0	0	0	0	0	1098	0	1115	0	0	0
RFODOWSR102/24/6780020	35,910	1117	740.46	31.34	30	39.81	1.0	221	66	118	88	0	0	0	0	0	33	592	0	0	0
RFODOWSR102/24/6781090	34,996	1117	740.46	31.34	30	39.81	1.0	162	74	15	74	29	0	0	0	0	486	280	0	0	0
RFODOWSR103/03/6780020	32,325	1124	750.63	21.26	35.03	15.19	1.0	0	0	0	0	0	22	154	0	0	448	501	0	0	0
RFODOWSR103/03/6781030	38,507	1117	750.46	41.30	30.03	15.04	1.0	162	22	132	7	44	0	0	0	0	330	418	0	0	0
RFODOWSR103/03/6782050	36,259	970	750.55	31.45	40.03	14.84	1.0	198	29	206	7	0	0	0	0	0	103	426	0	0	0
RFODOWSR103/03/6783020	33,170	1150	785.36	56.57	35.02	10.14	1.0	0	0	0	0	0	0	0	0	0	0	1150	0	0	0
RFODOWSR103/10/6780020	38,784	1110	770.37	56.44	29.97	15.1	1.0	88	37	191	7	59	0	0	0	0	360	368	0	0	0
RFODOWSR103/10/67810565	38,832	1110	780.60	26.67	25	14.76	1.0	110	7	191	15	96	0	0	0	0	334	357	0	0	0
RFODOWSR103/10/6782030	36,280	1125	770.53	36.43	29.97	15.12	1.0	162	37	206	37	0	0	0	0	0	136	548	0	0	0
RFODOWSR103/10/6783010	39,077	1114	770.45	46.43	29.97	15.12	1.0	74	0	338	15	15	0	0	0	0	162	513	0	0	0
RFODOWSR103/17/6780050	37,287	1117	785.63	21.70	20.03	14.75	1.0	66	51	176	29	37	0	0	0	0	368	390	0	0	0
RFODOWSR103/17/6781060	37,089	1110	780.42	46.44	25	20.23	1.0	125	37	191	29	0	7	0	0	0	128	592	0	0	0
RFODOWSR103/17/6782020	40,005	559	780.53	36.68	25	9.76	1.0	44	66	375	15	0	7	0	0	0	26	26	0	0	0
RFODOWSR103/17/6783010	22,700	2,074	800.23	71.68	40.01	15.19	1.0	0	0	0	0	0	0	0	0	976	0	1098	0	0	0
RFODOWSR103/31/6780060	37,032	1,110	800.39	51.77	30.01	14.93	1.0	118	29	206	29	66	0	0	0	0	51	609	0	0	0
RFODOWSR103/31/6781020	40,868	996	810.59	26.70	29.98	20.23	1.0	7	37	331	37	0	0	0	0	437	37	110	0	0	0
RFODOWSR103/31/6782010	36,277	1,197	800.47	41.77	30.01	14.93	1.0	81	37	265	29	0	0	0	0	0	139	646	0	0	0
RFODOWSR103/31/6783010	35,652	551	800.60	26.76	30.01	14.94	1.0	7	81	272	37	0	0	0	0	0	30	125	0	0	0
RFODOWSR104/07/6780020	34,758	1,103	820.49	41.91	30.02	9.98	1.0	132	37	88	44	81	0	0	0	0	309	412	0	0	0
RFODOWSR104/07/6781060	34,201	1,109	820.39	51.92	30.01	14.97	1.0	0	0	0	0	0	88	140	0	0	632	250	0	0	0
RFODOWSR104/07/6782010	34,369	559	820.60	26.91	30.02	14.99	1.0	162	88	59	162	0	0	0	0	0	87	0	0	0	0
RFODOWSR104/14/67810120	29,558	1,102	830.65	21.94	19.99	15.01	1.0	0	0	243	0	7	0	0	0	0	379	474	0	0	0
RFODOWSR104/14/6782070	37,084	1,117	830.50	36.95	20	19.99	1.0	37	0	272	59	0	0	0	0	0	632	118	0	0	0
RFODOWSR104/14/6783000	37,955	558	830.40	51.95	19.99	14.99	1.0	7	0	492	0	0	0	0	0	0	0	59	0	0	0
RFODOWSR107/08/6681010	36,000	1,216	693.09	101.15	13.78	13.78	1.0	0	0	0	0	0	0	0	0	0	0	1216	0	0	0
RFODOWSR107/08/6682020	25,200	2,074	721.00	97.78	18	18	1.0	0	0	0	0	0	0	0	0	488	0	1586	0	0	0

Document ID Number (Sorted by ID)	Weight (lb)	Volume (ft^3)	Disposal Location[a] (upper left corner) X-axis (ft)	Disposal Location[a] (upper left corner) Y-axis (ft)	Disposal Footprint Width (ft)	Disposal Footprint Height (ft)	Disposal Footprint Scale Factor	Waste Volumes by Type (ft^3) — Rocky Flats Plant Wastes: Series 741 Sludge	Series 742 Sludge	Series 743 Sludge	Series 744 Sludge	Line Generated Waste	Beryllium Contaminated Waste	Roaster Oxide (DU[b])	Graphite	Filters	Combustible Debris	Non-Combustible Debris	Non-Rocky Flats Plant Waste[c]: Sludge	Combustible Debris	Non-Combustible Debris
RFODOWSR107/22/6682010	25,300	1,207	723.13	101.44	13.73	13.73	1.0	0	0	0	0	0	0	0	0	0	0	1207	0	0	0
RFODOWSR107/22/6683000	23,700	1,278	737.92	101.22	14.13	14.13	1.0	0	0	0	0	0	0	0	0	0	0	1278	0	0	0
RFODOWSR107/29/6682010	27,350	2,075	751.09	87.28	18.01	18.01	1.0	0	0	0	0	0	0	0	0	0	1037	0	1037	0	0	0
RFODOWSR107/29/6683020	37,851	1,624	582.29	66.92	15.93	15.93	1.0	0	0	0	0	0	88	88	22	0	1132	294	0	0	0
RFODOWSR108/05/6680010	26,050	1,411	772.56	100.88	14.85	14.85	1.0	0	0	0	0	0	0	0	0	0	0	1411	0	0	0
RFODOWSR108/05/6681010	32,300	1,395	782.61	101.04	14.76	14.76	1.0	0	0	0	0	0	0	0	0	0	0	1395	0	0	0
RFODOWSR108/05/6682000	29,663	1,129	593.78	48.32	13.28	13.28	1.0	0	0	0	0	125	20	0	0	0	474	511	0	0	0
RFODOWSR108/05/6683040	37,206	1,617	592.80	7.02	15.9	15.9	1.0	0	0	0	0	7	81	110	0	0	1125	294	0	0	0
RFODOWSR108/12/6682010	21,350	2,074	701.33	56.87	18	18	1.0	0	0	0	0	0	0	0	0	0	0	2074	0	0	0
RFODOWSR108/19/6680020	36,296	529	595.75	9.96	10	10	1.0	0	529	0	0	0	0	0	0	915	0	1159	0	0	0
RFODOWSR108/19/6681010	36,208	529	605.58	30.05	10	10	1.0	250	272	0	0	0	0	0	7	0	0	0	0	0	0
RFODOWSR108/19/6682010	26,700	1,157	803.36	89.98	13.45	13.45	1.0	0	0	0	0	0	0	0	0	0	0	1157	0	0	0
RFODOWSR108/19/6683010	15,800	1,623	812.13	88.82	15.92	15.92	1.0	0	0	0	0	0	0	0	0	0	0	1623	0	0	0
RFODOWSR108/25/6680000	30,800	2,084	791.07	87.59	18.05	18.05	1.0	0	0	0	0	0	0	0	0	0	244	1840	0	0	0
RFODOWSR108/25/6681000	26,400	1,934	741.56	67.51	17.38	17.38	1.0	0	0	0	0	0	0	0	0	0	122	1812	0	0	0
RFODOWSR109/12/6680000	32,795	559	610.67	20.09	10	10	1.0	265	177	0	0	0	0	0	0	0	59	59	0	0	0
RFODOWSR109/12/6681010	40,505	1,531	607.53	67.35	15.47	15.47	1.0	176	176	0	0	0	0	0	7	972	134	65	0	0	0
RFODOWSR109/23/6682000	25,200	1,982	636.46	66.54	17.6	17.6	1.0	0	0	0	0	0	0	0	0	0	488	1494	0	0	0
RFODOWSR109/30/6680010	32,997	1,730	620.09	85.33	25.01	19.79	1.0	0	0	0	0	0	0	0	280	1171	0	280	0	0	0
RFODOWSR109/30/6681020	31,355	1,103	620.25	65.33	25.01	19.8	1.0	0	206	59	0	0	0	0	0	0	785	52	0	0	0
RFODOWSR109/30/6682010	18,000	1,274	720.14	85.98	29.98	10.19	1.0	0	0	0	0	0	0	0	0	0	0	1274	0	0	0
RFODOWSR109/30/6683000	21,200	954	710.05	96.04	30.01	9.91	1.0	0	0	0	0	0	0	0	0	0	0	954	0	0	0
RFODOWSR110/07/6682000	20,750	1,982	732.72	74.96	24.99	12.39	1.0	0	0	0	0	0	0	0	0	1098	0	879	0	0	0
RFODOWSR110/17/6681010	29,158	1,095	649.13	18.88	13.08	13.08	1.0	0	0	0	0	0	0	0	551	0	544	0	0	0	0
RFODOWSR110/17/66820503	26,601	1,073	648.95	48.94	12.95	12.95	1.0	0	0	0	0	7	405	0	0	0	603	58	0	0	0
RFODOWSR110/21/6683010	21,250	1,967	650.34	55.67	50	19.84	1.0	0	0	0	0	0	122	0	0	1025	0	820	0	0	0
RFODOWSR110/28/6680050	33,679	559	650.26	65.61	29.99	19.79	1.0	235	235	0	0	0	0	0	0	0	88	0	0	0	0
RFODOWSR110/28/6681010	32,697	559	650.34	35.58	29.99	59.85	1.0	169	301	0	0	0	0	0	0	0	88	0	0	0	0
RFODOWSR110/28/6682010	12,850	858	720.11	86.04	49.99	15.25	1.0	0	0	0	0	0	0	0	0	0	0	858	0	0	0
RFODOWSR110/28/6683010	28,205	1,132	650.71	5.50	30	30	1.0	0	0	0	0	0	0	0	298	0	529	305	0	0	0
RFODOWSR111/04/6683000	22,200	2,074	730.25	66.32	40.02	19.76	1.0	0	0	0	0	0	0	0	0	732	0	1342	0	0	0
RFODOWSR112/02/6680080	37,496	1,132	690.34	55.84	20.01	19.89	1.0	0	294	0	0	0	14	0	36	0	551	236	0	0	0
RFODOWSR112/02/6681060	31,213	1,125	660.60	25.71	30	14.75	1.0	0	0	0	0	0	0	0	176	0	558	389	0	0	0
RFODOWSR112/02/6682050	36,221	1,117	660.53	35.70	29.99	14.77	1.0	0	169	125	0	0	0	0	21	0	589	213	0	0	0
RFODOWSR112/02/6683010	34,935	1,103	660.42	45.69	30	19.79	1.0	0	125	110	0	0	0	0	0	0	537	331	0	0	0
RFODOWSR112/09/6680040	25,102	1,132	660.39	50.71	34.98	19.8	1.0	0	0	0	0	7	0	0	73	0	486	566	0	0	0
RFODOWSR112/09/6681010	28,712	1,132	660.52	35.71	34.97	19.79	1.0	0	0	0	0	0	353	110	0	0	632	36	0	0	0

Document ID Number (Sorted by ID)	Weight (lb)	Volume (ft^3)	Disposal Location[a] (upper left corner) X-axis (ft)	Disposal Location[a] (upper left corner) Y-axis (ft)	Disposal Footprint Width (ft)	Disposal Footprint Height (ft)	Disposal Footprint Scale Factor	Waste Volumes by Type (ft^3) — Rocky Flats Plant Wastes: Series 741 Sludge	Series 742 Sludge	Series 743 Sludge	Series 744 Sludge	Line Generated Waste	Beryllium Contaminated Waste	Roaster Oxide (DU[b])	Graphite	Filters	Combustible Debris	Non-Combustible Debris	Non-Rocky Flats Plant Waste[c]: Sludge	Combustible Debris	Non-Combustible Debris
RFODOWSR112/09/6682050	32,540	559	660.76	5.72	34.98	19.77	1.0	228	154	15	0	0	0	0	0	0	15	147	0	0	0
RFODOWSR112/09/6683030	32,124	559	660.64	20.71	34.97	19.78	1.0	374	51	22	0	0	0	0	0	0	81	29	0	0	0
RFODOWSR112/12/64800	31,879	1,117	571.86	9.05	4.99	100.1	1.0	110	110	0	0	0	0	0	0	0	580	316	0	0	0
RFODOWSR112/12/64810	27,538	1,102	566.86	8.98	4.99	100.19	1.0	162	74	0	0	0	0	0	0	0	867	0	0	0	0
RFODOWSR112/12/64820	27,534	1,146	561.85	9.33	5.02	99.45	1.0	29	206	0	0	0	0	0	0	0	912	0	0	0	0
RFODOWSR112/12/64830	36,930	1,110	566.86	8.98	4.99	100.19	1.0	0	0	0	0	0	51	0	0	0	229	831	0	0	0
RFODOWSR112/12/64840	32,134	1,117	566.86	8.98	4.99	100.19	1.0	206	29	0	0	0	0	0	0	0	640	243	0	0	0
RFODOWSR112/12/64900	26,926	1,646	561.85	9.33	5.02	99.45	1.0	0	0	0	0	0	382	0	0	0	448	816	0	0	0
RFODOWSR112/16/6680020	38,213	1,117	675.46	40.71	15	19.88	1.0	265	59	0	0	0	58	0	21	0	536	176	0	0	0
RFODOWSR112/16/6681020	30,583	1,117	675.63	20.71	14.99	19.87	1.0	0	0	0	0	0	7	0	7	0	559	543	0	0	0
RFODOWSR112/16/6682010	32,901	559	675.20	80.58	15	5.13	1.0	140	287	44	0	0	0	0	0	0	88	0	0	0	0
RFODOWSR112/16/6683010	38,731	1,132	675.30	60.70	15	19.89	1.0	323	0	0	0	0	0	0	0	0	595	213	0	0	0
TAN607SR002/21/67800[k]	500	15	735.67	21.11	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
TAN607SR004/21/64113	5,000	0	797.10	10.31	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TAN607SR005/16/66115	80,000	5,750	586.34	78.36	47.39	47.39	2.5	0	0	0	0	0	0	0	0	0	0	0	0	1917	3833
TAN607SR005/17/66115	40,000	5,750	601.36	76.48	47.39	47.39	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	5750
TAN607SR007/22/66220	10,000	250	674.97	106.05	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	83	167
TAN607SR007/27/66125	6,000	500	664.97	104.78	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	167	333
TAN607SR008/01/66240	20,000	600	694.97	104.67	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	200	400
TAN607SR008/06/66116	3,000	220	804.96	107.31	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	73	147
TAN607SR010/18/66120	12,000	162	650.14	85.42	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	162	0	0
TAN607SR010/20/66120	12,000	162	640.10	90.34	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	162	0	0
TAN607SR011/17/66800	900	264	635.48	5.49	75	85.14	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	132
TAN607SR012/03/65800	4,000	240	595.14	84.96	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	80	160
TAN633SR004/08/6621000	2,000	130	604.96	106.37	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	43	87
TAN633SR005/02/66130	18,000	800	604.40	102.72	11.18	11.18	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	800
TRA603SR001/20/67800[l]	4,100	144	685.30	65.70	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	48	96
TRA603SR001/20/67810	1,000	16	685.25	70.71	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
TRA603SR006/24/66160	6,000	450	664.97	104.98	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	450
TRA603SR006/24/66210	6,000	216	659.96	106.15	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	72	144
TRA642SR001/24/67820	600	200	690.25	70.75	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	67	133
TRA642SR004/12/66120	3,000	100	600.01	100.00	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
TRA642SR004/12/66370	3,000	108	600.01	100.00	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR004/13/66252	3,000	108	600.67	20.01	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR004/28/66251	2,000	108	594.96	106.51	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR004/28/66320	2,000	108	594.96	106.51	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR005/10/66230	2,000	108	639.96	106.88	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108

Document ID Number (Sorted by ID)	Weight (lb)	Volume (ft^3)	Disposal Location[a] (upper left corner) X-axis (ft)	Disposal Location[a] (upper left corner) Y-axis (ft)	Disposal Footprint Width (ft)	Disposal Footprint Height (ft)	Disposal Footprint Scale Factor	Waste Volumes by Type (ft^3) — Rocky Flats Plant Wastes: Series 741 Sludge	Series 742 Sludge	Series 743 Sludge	Series 744 Sludge	Line Generated Waste	Beryllium Contaminated Waste	Roaster Oxide (DU^b)	Graphite	Filters	Combustible Debris	Non-Combustible Debris	Non-Rocky Flats Plant Waste[c]: Sludge	Combustible Debris	Non-Combustible Debris
TRA642SR005/10/66496	2,000	108	639.96	106.88	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR005/11/66140	2,000	108	609.96	106.63	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR005/11/66230	2,000	108	604.95	106.59	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR005/11/66340	2,000	108	604.95	106.59	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR005/13/66130	2,000	108	599.96	106.55	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
TRA642SR011/15/66110	2,000	128	695.09	90.79	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	43	85
TRA642SR012/20/66210	4,000	150	655.71	15.46	10	10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	50	100
Totals[m]	3,580,541	142,930						7,511	6,350	6,639	992	792	2,075	941	1,506	13,183	26,037	50,735	1,279	5,923	18,967

Notes:

a. Disposal locations are relative to a coordinate system whose origin is located at the northwest monument of Pit 4 with the X-axis parallel to the north boundary of Pit 4.
b. DU = depleted uranium
c. Non-Rocky Flats Plant waste sources include various Idaho National Engineering and Environmental Laboratory (INEEL) generators.
d. ANL = Argonne National Laboratory
e. ARA = Auxiliary Reactor Area
f. CFA = Central Facilities Area
g. CPP = Chemical Processing Plant
h. NRF = Naval Reactor Facility
i. PER = Power Excursion Reactor
j. RFODOW = Rocky Flats Operation - Dow Chemical Company
k. TAN = Test Area North
l. TRA = Test Reactor Area
m. These totals are higher than those reflected in Tables 2 and 3 of EDF-4478. This table has not been adjusted to ignore the portion of some shipments that lie outside of the retrieval grid based on their retrieval footprint location and size.

Appendix B

Disposed Waste Geographical Distribution – Combined and by Waste Type – for the Described Area of Pit 4 (ARP Retrieval Area Including Angle of Repose)

This page is intentionally left blank.

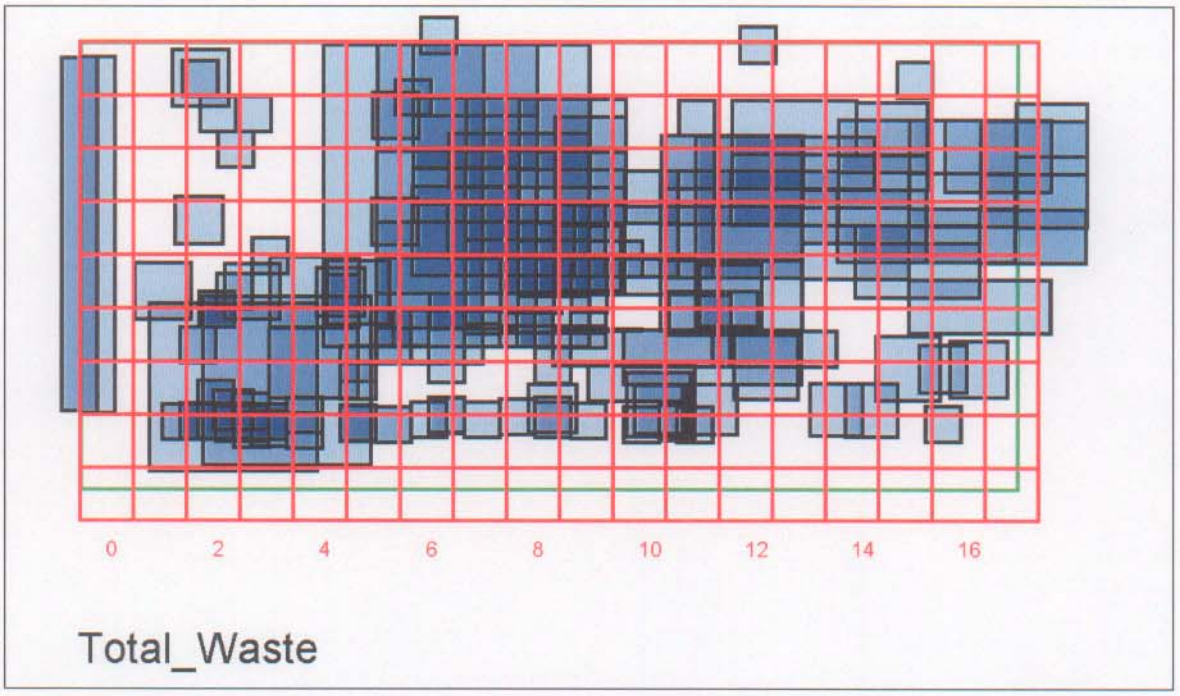

Figure B-1. Shipment locations for all disposals within the ARP retrieval area including angle of repose.

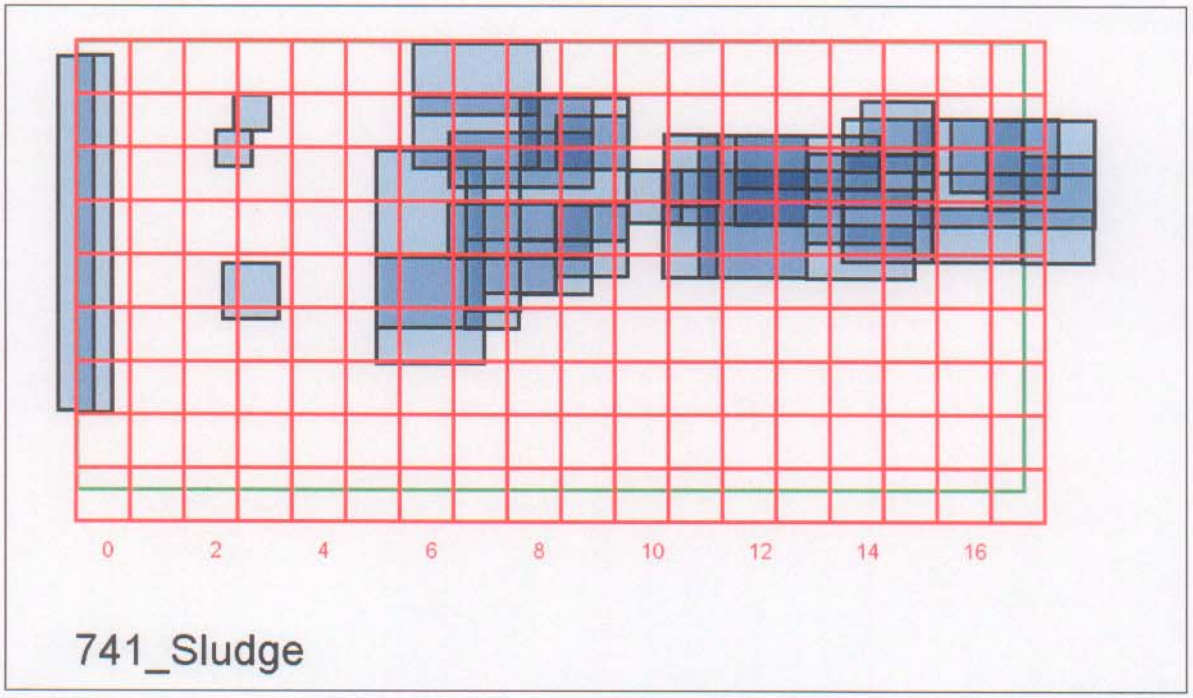

Figure B-2. Shipment locations for disposals containing RFP Series 741 sludge within the ARP retrieval area.

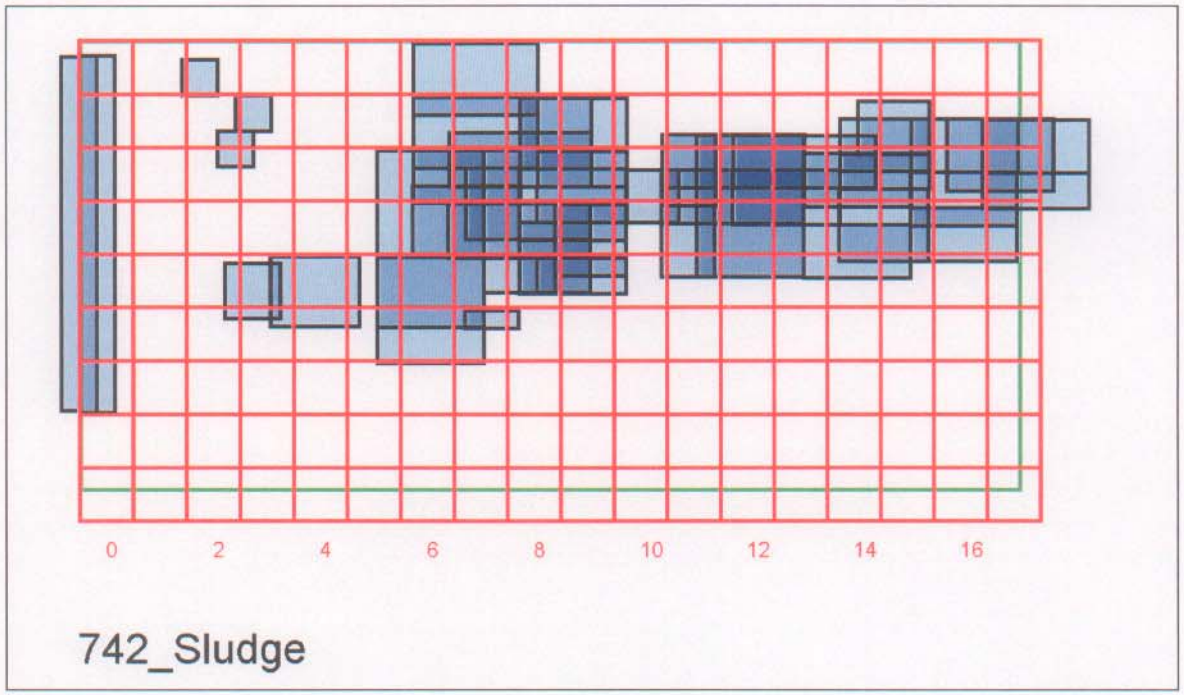

Figure B-3. Shipment locations for disposals containing RFP Series 742 sludge within the ARP retrieval area.

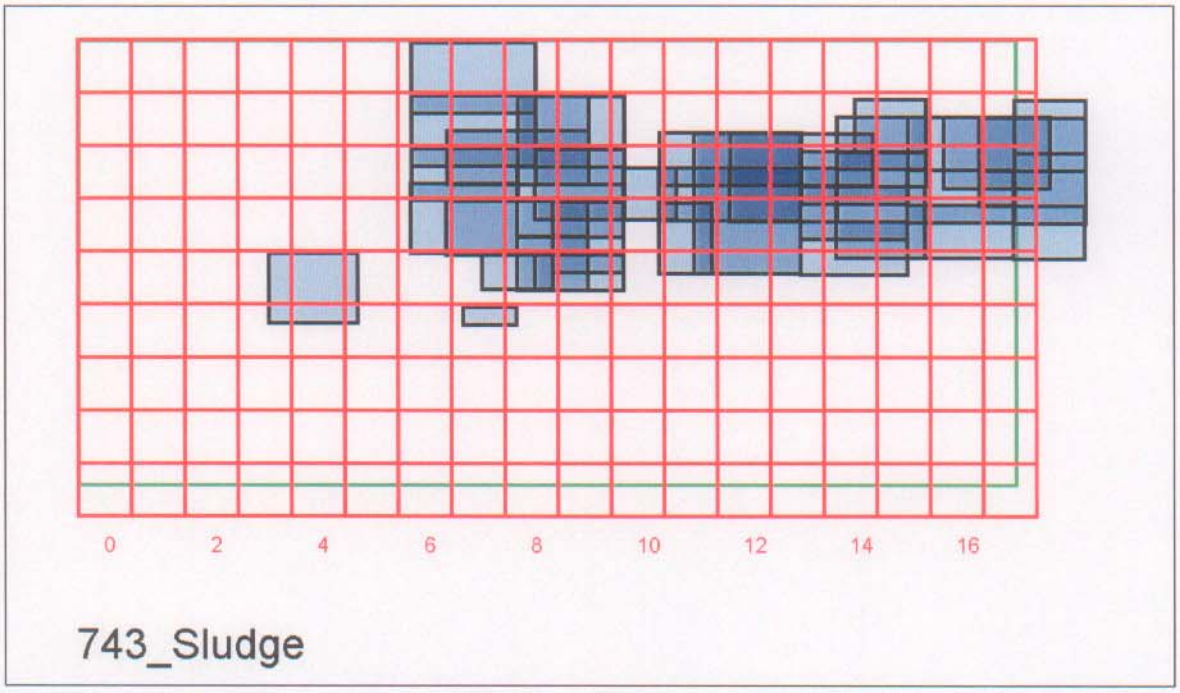

Figure B-4. Shipment locations for disposals containing RFP Series 743 sludge within the ARP retrieval area.

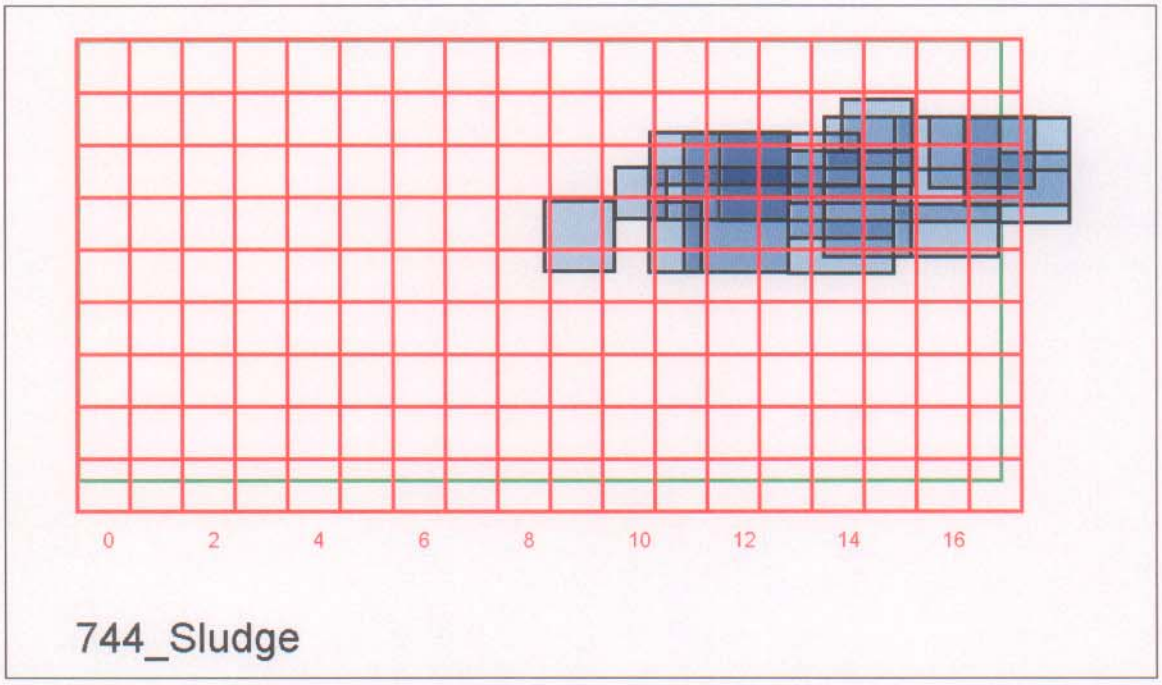

Figure B-5. Shipment locations for disposals containing RFP Series 744 sludge within the ARP retrieval area.

Figure B-6. Shipment locations for disposals containing RFP Series 745 sludge within the ARP retrieval area.

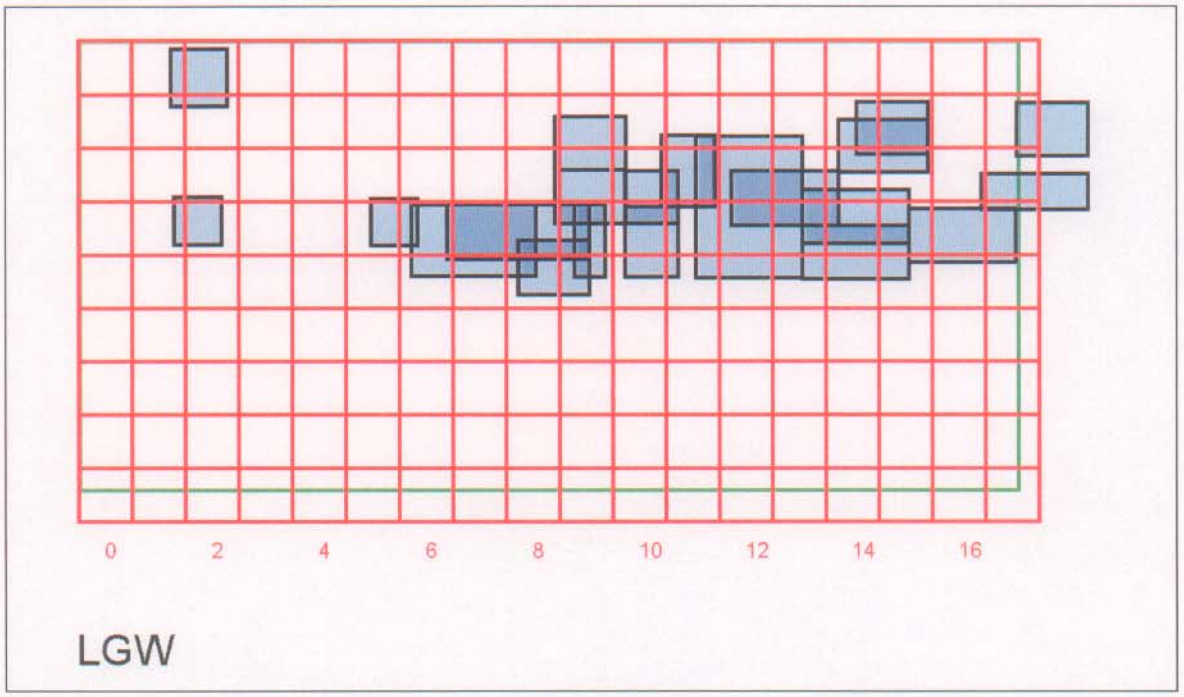

Figure B-7. Shipment locations for disposals containing RFP line generated waste within the ARP retrieval area.

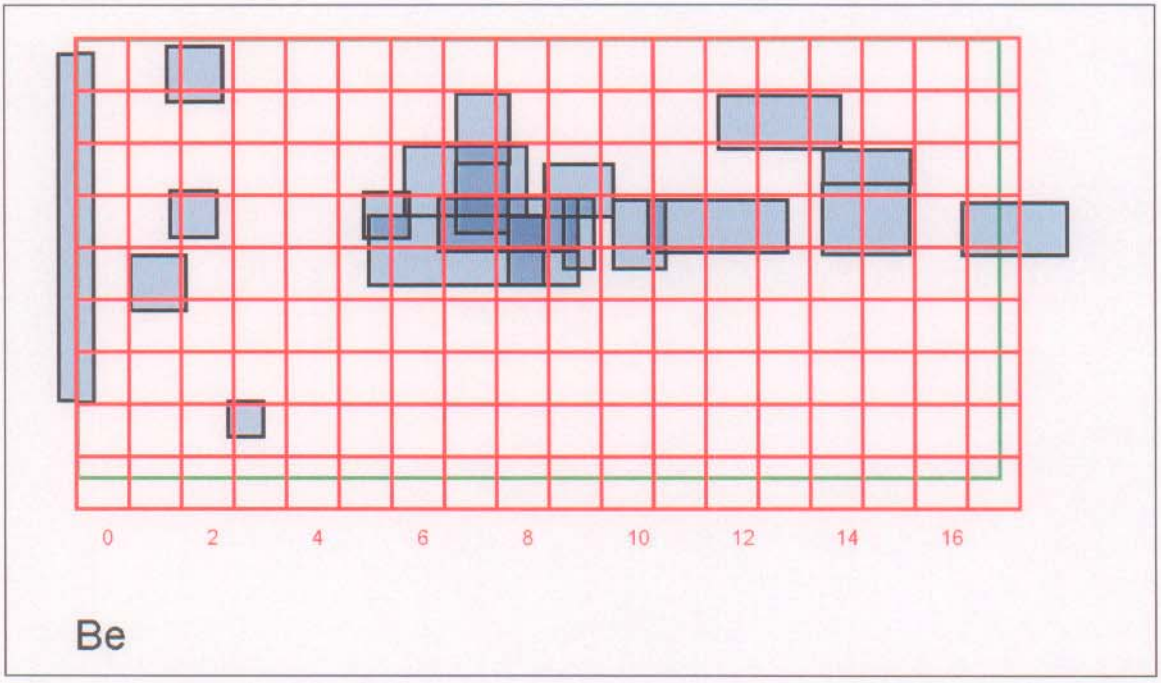

Figure B-8. Shipment locations for disposals containing RFP beryllium contaminated waste within the ARP retrieval area.

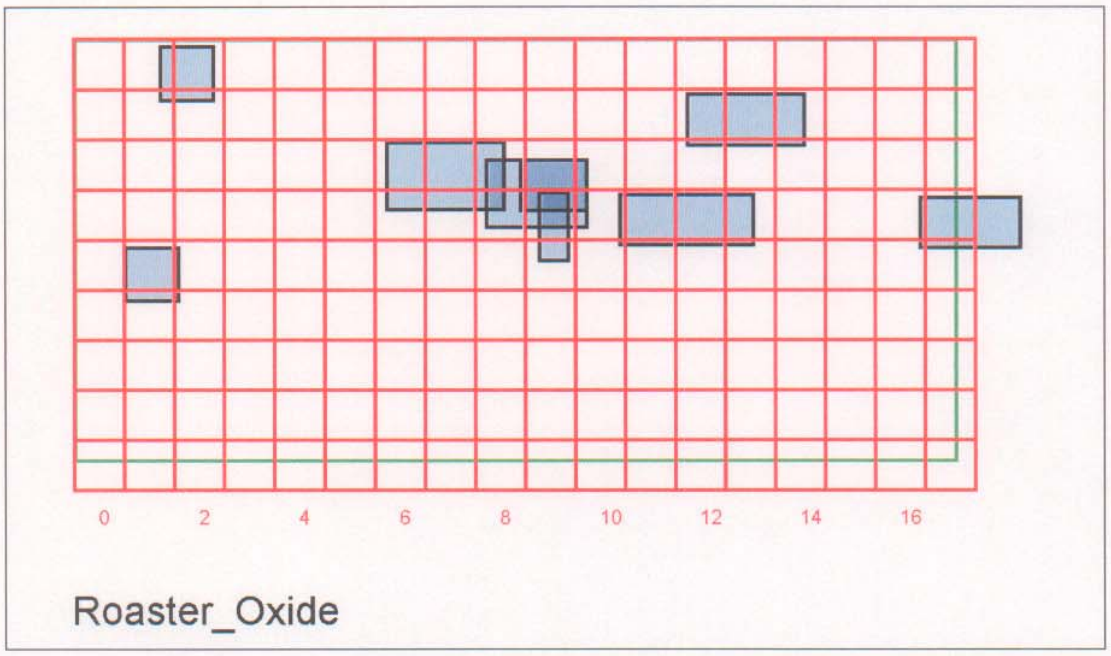

Figure B-9. Shipment locations for disposals containing RFP roaster oxide waste within the ARP retrieval area.

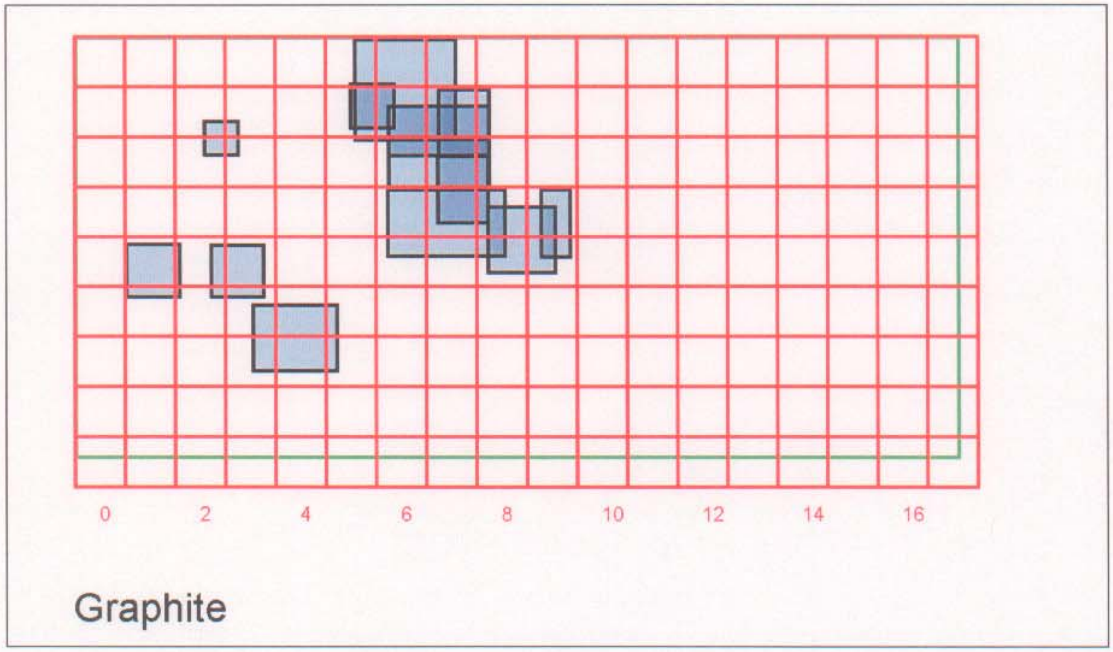

Figure B-10. Shipment locations for disposals containing RFP graphite waste within the ARP retrieval area.

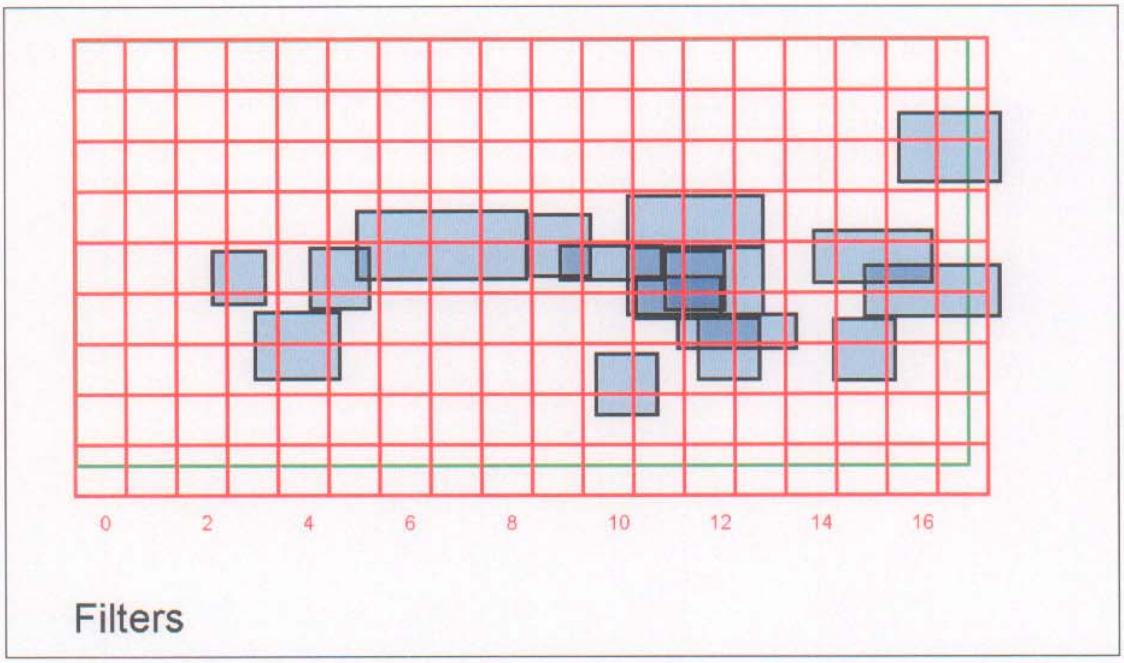

Figure B-11. Shipment locations for disposals containing RFP filter and filter media waste within the ARP retrieval area.

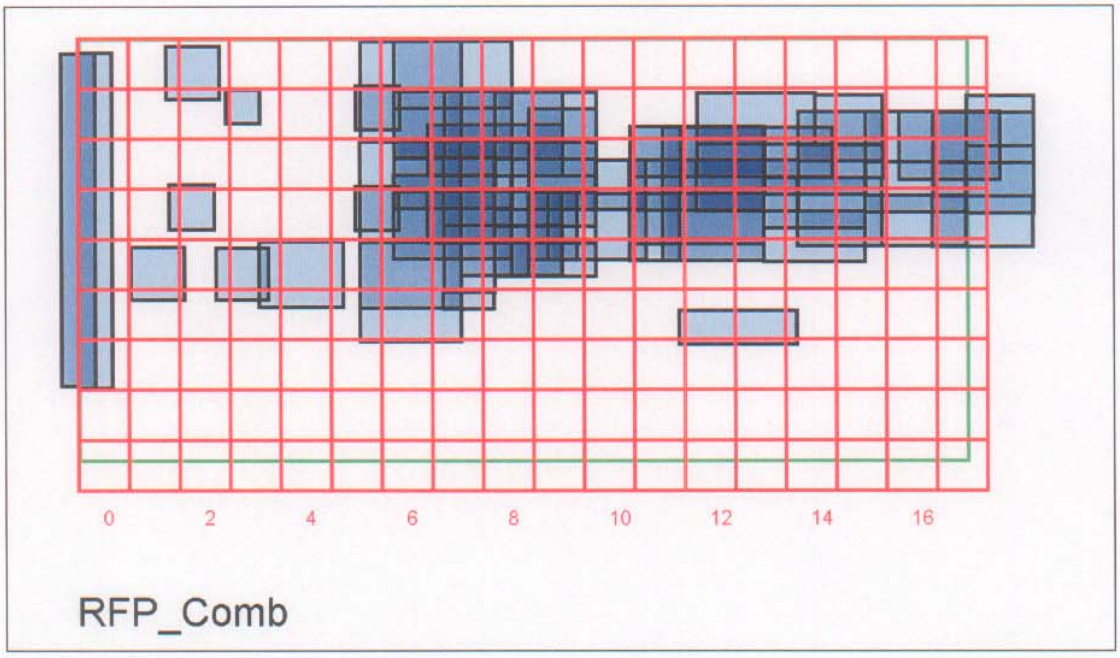

Figure B-12. Shipment locations for disposals containing RFP combustible debris within the ARP retrieval area.

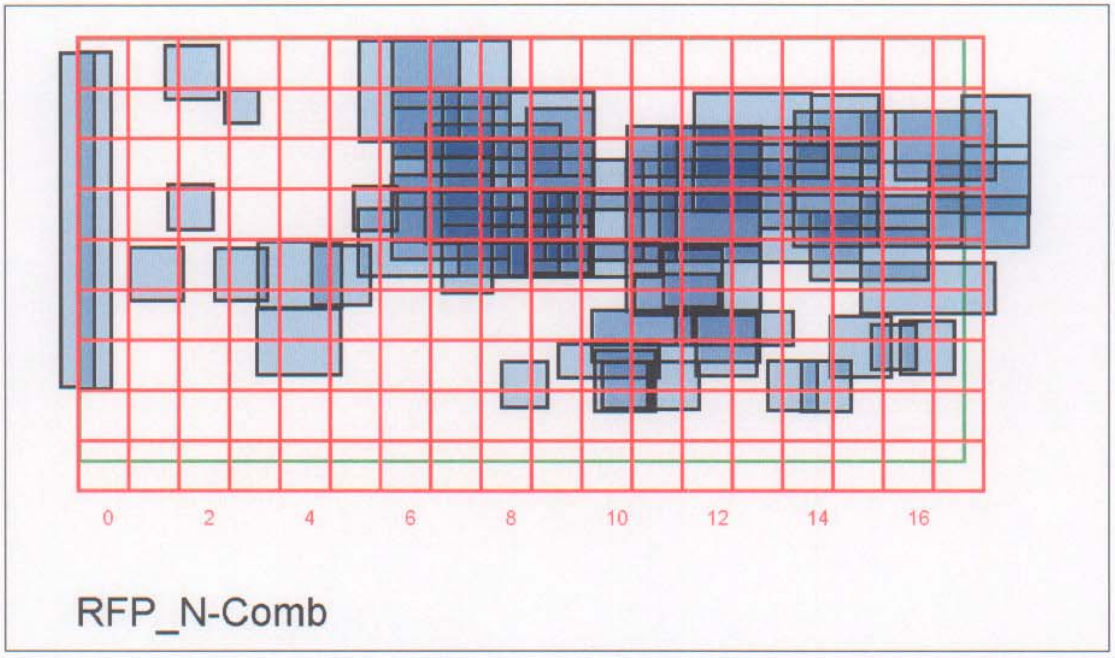

Figure B-13. Shipment locations for disposals containing RFP noncombustible debris within the ARP retrieval area.

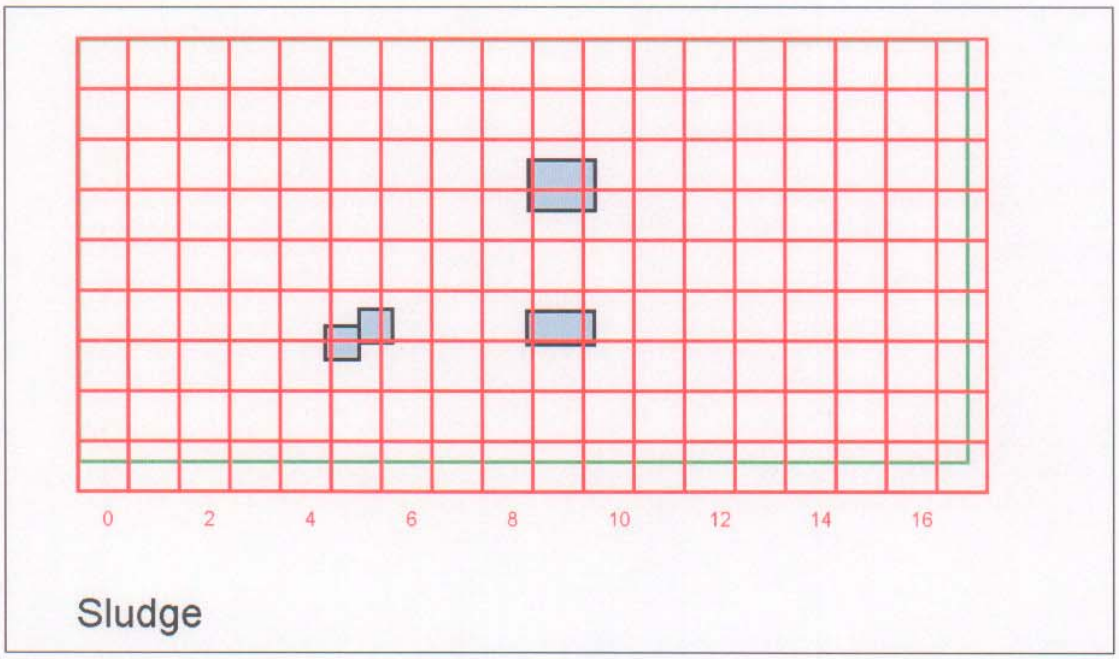

Figure B-14. Shipment locations for disposals containing INEEL sludge within the ARP retrieval area.

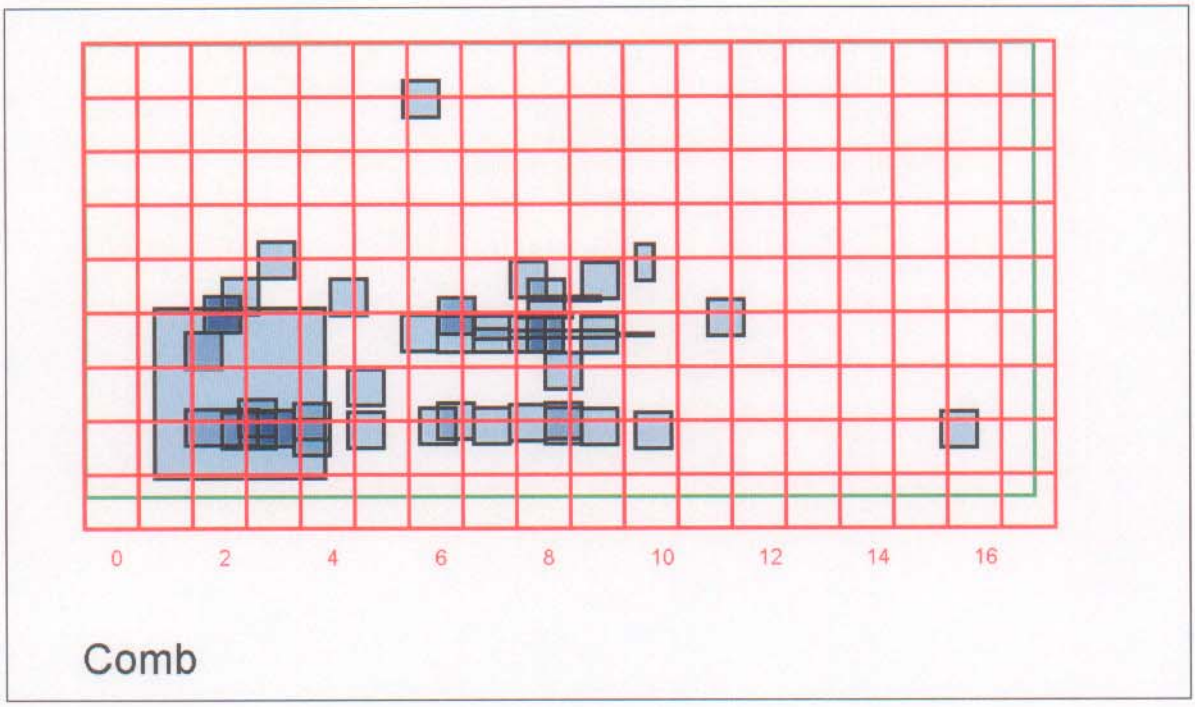

Figure B-15. Shipment locations for disposals containing INEEL combustible debris within the ARP retrieval area.

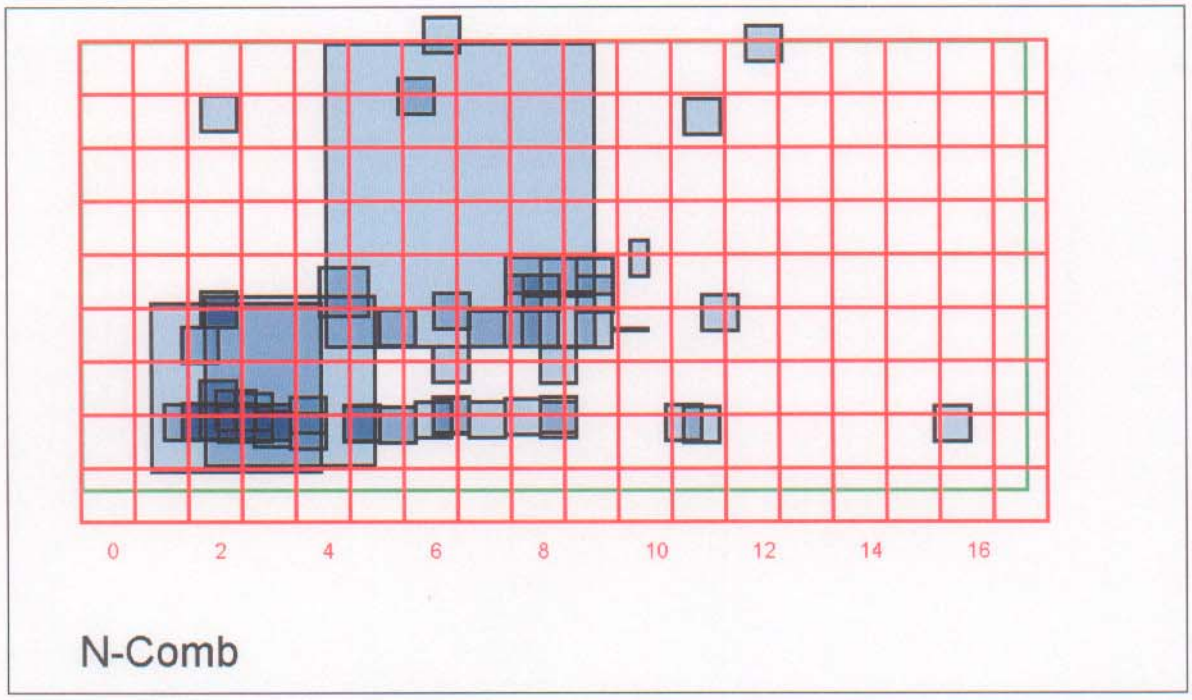

Figure B-15. Shipment locations for disposals containing INEEL noncombustible debris within the ARP retrieval area.

Appendix C

Targeted Waste Volume and Activity Estimates by Retrieval Grid for the Described Area of Pit 4 (ARP Retrieval Area Including Angle of Repose)

This page is intentionally left blank.

Targeted Waste Volume

(Includes Volume of 741 & 743 Sludges, Graphite, Filters, and Roaster Oxide in Cubic Feet)

Grid #	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	50.90	22.42	65.17	0.00	0.00	48.82	138.56	115.02	43.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	71.47	5.74	123.33	277.34	0.00	336.65	440.38	275.86	303.88	320.98	64.30	85.59	114.68	117.82	204.23	267.23	193.80	317.45
3	71.47	0.00	86.80	51.20	0.00	10.34	178.97	377.76	390.33	510.01	289.49	446.25	396.88	432.98	622.56	536.58	346.09	538.45
4	71.47	0.00	0.00	0.00	0.00	70.01	231.27	486.66	442.79	746.89	288.94	783.73	613.44	498.59	426.16	467.29	316.19	383.20
5	71.47	80.64	265.72	673.62	137.64	377.27	281.99	526.82	628.92	817.56	271.34	683.56	512.33	180.51	241.12	521.17	550.76	239.85
6	71.47	20.04	67.62	358.77	458.83	200.55	55.16	185.49	44.23	0.00	9.60	525.42	1011.41	568.08	79.72	156.32	185.15	173.20
7	69.02	0.00	0.00	207.47	458.99	99.29	1.06	0.60	0.00	0.00	194.83	135.67	433.13	312.72	21.23	123.12	18.47	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.87	65.51	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	477.27	128.84	608.64	1568.40	1055.46	1142.93	1327.39	1968.21	1853.66	2395.44	1218.37	2725.73	3081.87	2110.70	1595.02	2071.71	1610.46	1652.15

First 1/4 Acre **10130.8** | Second 1/4 Acre **18461.5** | Total for 1/2 Acre **28592.25**

Figure C-1. Targeted waste volume estimates by grid location for all disposals within the ARP retrieval area including angle of repose.

Targeted Waste TRU Activity

(Includes Only Pu-239, Pu-240, and Am-241 Activity in Curies)

Grid #	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	134.67	0.00	0.00	0.00	0.00	35.04	224.92	247.45	124.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	189.08	0.00	304.43	801.41	0.00	172.13	490.90	505.77	657.33	727.31	147.23	162.19	79.35	71.15	169.54	209.35	24.10	137.13
3	189.08	0.13	246.56	145.17	0.00	26.32	183.90	552.89	507.10	556.72	391.85	904.40	575.84	585.75	556.64	350.82	99.67	332.59
4	189.08	1.14	3.75	0.00	0.00	30.52	89.84	658.53	499.59	456.04	294.94	800.00	425.20	376.27	324.46	332.52	206.28	174.28
5	189.08	0.00	125.90	322.90	0.09	138.55	319.48	941.83	856.87	361.99	59.33	286.80	114.46	83.45	77.01	73.84	40.31	24.19
6	189.08	0.00	32.06	128.33	102.04	91.98	159.60	442.61	101.15	0.00	0.63	23.60	70.41	36.69	0.28	9.18	9.57	8.78
7	182.59	0.00	0.00	51.48	113.89	25.84	3.04	1.71	0.00	0.00	13.92	9.13	71.48	47.94	0.44	8.18	1.23	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	4.68	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals	1262.66	1.27	712.70	1449.29	216.02	520.38	1471.68	3350.79	2746.65	2102.06	915.04	2190.80	1336.74	1201.25	1128.37	983.89	381.16	676.97

First 1/4 Acre **11731.4** | Second 1/4 Acre **10916.3** | Total for 1/2 Acre **22648**

Figure C-2. Targeted waste activity estimates by grid location for all disposals within the ARP retrieval area including angle of repose.